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HISTORIC CONTEXT FOR EVALUATING
MID-CENTURY MODERN MILITARY BUILDINGS

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EXECUTIVE SUMMARY

The Department of Defense (DoD) owns thousands of buildings constructed during the years between 1950 and 1975. Although the DoD re-used many World War II-era buildings during these years, they also constructed many new installations and individual buildings to meet the highly specialized needs of the military as it dealt with the challenges of the Cold War. Section 110 of the National Historic Preservation Act of 1966 requires the DoD to evaluate properties for their eligibility for the National Register of Historic Places (National Register) and to keep a list of properties that are eligible for National Register listing.

Frequently, properties owned by the federal government are first evaluated for National Register eligibility when they are at or close to fifty years of age. Thousands of DoD properties built in the 1950s have recently passed the fifty-year mark, and thousands more that were built in the 1960s and 1970s are now reaching that threshold, or are just a few years away.

Many of these buildings reflect at least some influence of architectural Modernism, a broad term that covers a number of architectural movements and styles during the twentieth century that represented a break with past architectural styles and trends. This guide has been created to offer information and guidance to those evaluating the National Register eligibility of military properties built between 1950 and 1975 that were influenced by architectural Modernism. In particular, this document discusses the special issues that arise when applying National Register Criterion C (the criterion for architectural and engineering significance) to buildings constructed between 1950 and 1975 that have some relationship to the Modern architectural movements.

This document also contains a historic context that traces the development of a Modernistic architectural sensibility in U.S. military architecture from its industrial origins during World War I through the first half of the 1970s. Guidance is given on the physical features and materials that are important in the various Modernist architectural movements of the 1950–1975 years, as well as information on what sources should be consulted when researching the architectural significance of military buildings. This document concludes with sample assessments for a number of buildings at Wright-Patterson Air Force Base (Wright-Patterson).

The term “Modernism” signifies architectural styles and movements that embraced the construction materials and technologies of their time and strove to create something new rather than reviving the architectural styles of the eighteenth century and before. A wide variety of these movements were active in the 1950–1975 years. This time period begins with some designers clinging to older 1940s styles such as Art Moderne or Stripped Classicism. Emphasis then transitions to European-influenced Modernism, with the Miesian movement (named after Mies van der Rohe) being particularly influential, followed by several movements that peak in the United States in the 1960s, including New Formalism and Brutalism, which remained popular into the first half of the 1970s.

The aim of this guide is to give the reader some insight into what types of significant architectural features would make a Modernist building eligible for the National Register under the National Register Criterion C. Also included are some examples of less-distinguished buildings that would have a fairly low potential for architectural significance associated with Modernism. This document will hopefully also provide guidance in addressing the special issues of material integrity that are an essential part of determining if an architecturally significant building retains enough of its original features to qualify for National Register eligibility for architectural or engineering significance.

Please note again that this guide covers only architectural significance under Criterion C. Military buildings built between 1950 and 1975 may also have Cold War historical significance due to associations with historical events and patterns under National Register Criterion A, and possibly for association with important persons under Criterion B. It is not the intent of this document to address Cold War military historical significance, as several contexts and guides have already been issued by some of the service branches (most notably the U.S. Department of the Air Force and the U.S. Department of the Navy), and these can be used to help assess the Cold War historical significance of buildings from the 1950–1975 years. Appendix B contains a list of references for sources useful in addressing Cold War significance.

Although the main emphasis of this report is on evaluating individual buildings for National Register eligibility, some guidance is included for dealing with historic districts and landscapes. In some cases, the DoD built entirely new installations or campus areas within existing installations during the 1950–1975 years. When evaluating groups of buildings from this time period, consultants and cultural resource managers should be aware of the possibility that historic districts might be eligible for the National Register. In addition to buildings, these districts may also include significant planning and landscape features, and evaluators must be aware of such things as: the placement of the buildings; any built features like walls, plazas, and roads; and landscape plantings, like trees and lawn areas.

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LIST OF ACRONYMS AND ABBREVIATIONS

Term	Definition
ACHP	Advisory Council on Historic Preservation
AFMC	Air Force Materiel Command
DoD	Department of Defense
HDC	Hardlines Design Company
IIT	Illinois Institute of Technology
National Register	National Register of Historic Places
NAVFAC	Naval Facilities Engineering Command
NHL	National Historic Landmark
NPS	National Park Service
PPV	Public-Private Venture
Quartermaster General	Office of the Quartermaster General's Construction Service
RTC	Recruit Training Command
SAC	Strategic Air Command
SOM	Skidmore, Owings & Merrill, Inc.
Wright-Patterson	Wright-Patterson Air Force Base

INTRODUCTION

Opening Statement

This guide is intended to assist consultants, cultural resources managers, and other individuals who would be evaluating Department of Defense (DoD) buildings that date from the years 1950 to 1975 and exhibit characteristics of architectural design that are associated with Modernist architectural movements. Properties owned by the DoD are evaluated for eligibility for the National Register of Historic Places (National Register) in connection with Section 110 and Section 106 of the National Historic Preservation Act of 1966, as modified. Many buildings are surveyed for historical significance when they are at or near fifty years old, an important threshold when considering a building's eligibility for the National Register.

Architectural Modernism had its strongest period of dominance in American architecture during the decades after the end of World War II in 1945, and many buildings with Modernist characteristics dating from the 1950s through the first half of the 1970s have now reached or are approaching the fifty-year threshold for evaluation. Many DoD buildings influenced by architectural Modernism have been evaluated for National Register eligibility in recent studies, and many more will need to be evaluated in the coming years.

Architectural Modernism is a somewhat loose term that covers many different architectural movements of the twentieth century. Although these movements vary considerably, one can generally characterize Modernism as a rejection of past architectural styles and an embrace of advanced materials and technologies. In many of the movements associated with Modernism, a building is thought of more as a volume enclosing space rather than as a series of solid walls. The considerable variation of the buildings constructed under the influence of these movements makes it difficult to create a definitive list of characteristics shared by all of them; however, the following list summarizes the important characteristics that many of them share:

- The buildings reflected recent ideas instead of architectural concepts of the past.
- New materials such as concrete, steel, and glass were used in a way that exposed or represented the building's structure.
- Buildings were designed as structural skeletons, with thin walls and, in some cases, large amounts of glass, as opposed to heavy exterior walls.
- Purely ornamental features were discouraged or at least used sparsely.
- Imitation finishes in which one material was made to resemble another were avoided.
- Interiors had open floor plans instead of a series of enclosed rooms.

Many different movements grew out of Modernism from the 1950s through the 1970s, and the diversity of forms and materials used is one of the subjects of this guide. In addition, since these buildings are relatively recent in date, there has not been as much time to step back and study these resources, especially the architecture of the late 1960s and early 1970s, which at the time of the writing of this document in 2011–2012, was only 35 to 45 years in the past. As a result, not a lot of guidance is available for evaluating DoD buildings in relation to architectural Modernism.

This document mentions buildings associated with the Air Force, Navy, Army, and Marine Corps, but since this project is being completed with the cooperation and support of Air Force

Materiel Command (AFMC) and Wright-Patterson Air Force Base (Wright-Patterson), many context and field survey examples are associated with Wright-Patterson. The intent of this guide, however, is to be applicable DoD-wide, and the historic context covers the history of architectural Modernism in the Army, Navy, and Marine Corps, as well as the Air Force.

The Fifty-Year Mark

Many of the buildings from the earlier part of the era covered in this study (1950–1967) are past fifty years old or are within five years of turning fifty. The fifty-year mark is an important threshold for assessing the National Register eligibility of a building; buildings that are fifty years old or older are evaluated under the National Register Criteria of A, B, C, and D (see page 69 for details), whereas buildings that are younger than fifty years old must be evaluated with additional, more rigorous considerations that take into account the relatively young age of the property.

The fifty-year mark is a factor to consider when evaluating the architectural significance of a building, but it is also very important to remember that the fifty-year threshold is "…an arbitrary span of time designed as a filter to ensure that enough time has passed to evaluate [a given historic] property in a [given] historic context….(Luce and Sherfy 1998:6). The fifty-year cutoff is a management practice; it is not a threshold requiring legal compliance, and it is not specified by the National Historic Preservation Act of 1966 (as amended through 2006) or implementing regulations (Protection of Historic Properties, 36 CFR Part 800).

In past decades, buildings dating to 1950–1967 would have required an exceptional level of architectural importance to be eligible for the National Register under Criterion C. This is due to Criteria Consideration G, which is the National Park Service's specific guidance for dealing with properties that are either under fifty years old, or that have become historically significant because of events that happened within the last fifty years (discussed in detail on page 89). When considering architectural merit, the construction date of a building is generally used to determine whether Criteria Consideration G applies. Since 1950–1967 buildings are now either close to or past the fifty-year mark; these facilities need only meet the standard requirement (for this study, Criterion C, that they be significant in architecture or engineering). These buildings will now have to be examined with a somewhat different approach than what was used in the past.

In some eligibility surveys for buildings, a strict fifty-year mark is used to determine whether Criteria Consideration G applies for architectural merit. For the year of the completion of this report, 2012, the cut-off year would be 1962, but some government agencies also cast a slightly wider net and include buildings that are within five years of being fifty years old, in the interest of not having to re-survey properties that are quite close to being fifty. In such cases, a five-year buffer is added to the fifty-year standard, meaning that a property forty-five years old or older is not subject to Criteria Consideration G. Using the fifty-year standard plus a five-year buffer, the year 1967 would be the cut-off year for the fifty-year mark for the year 2012.

As of 2012, buildings from the later portion of the time period covered in this context (1968–1975) are still more than five years away from reaching the fifty-year mark. These buildings are still subject to Criteria Consideration G and would have to be of exceptional architectural or engineering importance to be eligible for the National Register under Criterion C. It is wise to begin trying to understand the design significance of these buildings and what factors might make

these buildings significant under Criterion C, now, when Criteria Consideration G applies, and again in the future when they are fifty years old and Criteria Consideration G no longer applies.

Building Types Covered in This Document

In general, certain types of buildings are visited by a wide range of military personnel, and in many cases, by military families, civilian military employees, contractors, and sometimes the general public. Such buildings, which include administrative buildings, libraries, training buildings, recreational facilities, training barracks, mess halls, clinics, and hospitals, are therefore part of the image that the Military Services present to the world. Laboratories and test facilities, although often not open to a wide range of personnel and typically not to the general public, were also at times designed with concern for interior space and the exterior image of the building. These buildings are likely to be designed in a way that reflects architectural trends of their time.

In contrast, most military installations include small, plain structures that are built entirely to be functional, with little consideration given to architectural design. Many of these buildings are intended to be used by military personnel only and may be located in isolated areas. Such utilitarian buildings are not likely to reflect Modernist architectural influences and are discussed briefly on page 4.

This report focuses on certain building types to avoid duplicating other works of guidance that cover military buildings of the 1950–1975 era. Certain building types (discussed below) have been dealt with at length in other documents or contexts and will not be focused on heavily in this study. The types of facilities that are discussed extensively in this context include:

- Command facilities
- Administrative offices
- Training and educational facilities
- Barracks (especially those associated with training and education)
- Laboratories and test facilities
- Medical facilities
- Recreational and dining facilities

Building Types Covered in Previous Context Studies

Some of the building types that have been covered in previous context reports are hangars, ammunition storage units, military family housing, military chapels, and barracks. The previous studies are discussed here.

Hangars: These structures have been covered in several studies. Useful works include the 1999 Air Combat Command study of hangars by Webster et al., *Historical and Architectural Overview of Military Aircraft Hangars: A General History, Thematic Typology, and Inventory of Aircraft Hangars Constructed on Department of Defense Installations.* This publication provides fairly extensive information on military hangars, including the 1950s through the Cold War, and discusses hangar types used from the 1950s through the 1970s, such as the Modular Hangar. Most hangars of the era were built from standardized plans that were used repetitively on many installations, and many are fairly utilitarian structures that do not show characteristics

of high-style Modernism. Useful information on military hangar types and their evolution can also be found in Jayne Aaron's 2011 *Historical and Architectural Overview of Aircraft Hangars of the Reserved and National Guard Installations from World War I Through the Cold War* (Legacy Project no. 09-431). Military hangars were also In addition, many Air Force hangar types were discussed in detail by Karen Weitze, in the 1999 publication *Cold War Infrastructure for Air Defense: The Fighter and Command Missions.*

Ammunition Storage: These buildings are covered under a 2006 document, *Program Comment for World War II and Cold War Era (1939–1974) Ammunition Storage Facilities*, issued by the Advisory Council on Historic Preservation (ACHP) in association with the DoD. Since the comment offers an alternative to traditional Section 110 and Section 106 processes, these facilities are not treated extensively in this study. These structures are also usually designed according to standardized plans and are utilitarian in nature; ammunition storage buildings do not typically have a high level of architectural distinction and do not tend to be significant works of architectural Modernism. See Appendix C for a copy of the program comment.

Military Family Housing: A lot of DoD housing of the 1950–1975 years was produced under U.S. Congressional housing legislation, most notably the Wherry Act of the early 1950s and the Capehart Act of the later 1950s. Housing associated with this legislation, commonly known as Wherry and Capehart housing, comprises much of the military family housing built from the early 1950s through much of the 1960s. Wherry and Capehart housing is the subject of a 1966 extensive cultural resources context study by the U.S. Army Corps of Engineers Construction Engineering Research Laboratory, entitled *For Want of a Home: A Historic Context for Wherry and Capehart Military Family Housing.* Many of these properties have also been privatized through the recent Public-Private Venture program (PPV) and have been leased to private-sector partners. As a result of the PPV program, many of these properties are no longer under direct management by the military.

Military Chapels: A context on military chapels funded by a DoD Legacy agreement is currently underway by the U.S. Army Corps of Engineers Construction Engineering Research Laboratory. When this document is finished, it should provide lengthy information on this property type. While this Modernism study does not focus heavily on chapels, the context section covers the U.S. Air Force Academy Chapel (1956–1962) in Colorado Springs, by Skidmore, Owings & Merrill, because of its architectural importance.

Barracks: The ACHP document, *Program Comment for Cold War Era Unaccompanied Personnel Housing 1946–1974*, covers barracks dating to the Cold War years. The program comment provides alternatives to the traditional Section 106 process for these facilities and was developed with DoD. However, due to the importance of barracks in the design of many training and educational campuses of the 1950–1975 years, this document does discuss barracks. See Appendix C for a copy of the program comment.

Utilitarian Buildings

Numerous buildings on military installations are utilitarian facilities, such as ammunition magazines, where access is restricted to a small number of personnel for security reasons. Since these facilities were designed for use by military personnel only, these buildings are usually simple and functional in design, with no concern for aesthetics or the impression that the building would make on the viewer. In most cases, these buildings are isolated in areas

that are inaccessible to most people on the military installation, and so fairly few people ever even see them. These buildings are much less likely to be eligible for the National Register for their architectural merit associated with Modernism, and they are covered in this report only lightly, here in this section. Buildings in the utilitarian category include:

- Small wood-frame, concrete-block, brick, or poured-concrete utility sheds of plain design (see Figure 1). These buildings commonly housed water or sewage pumps, steam heating system equipment, or other types of small equipment.
- Small prefabricated sentry houses or security checkpoint buildings. These buildings are usually small, plain booths of plywood, fiberglass, or metal.
- Small magazines and other small utilitarian ammunition-storage buildings. Note also that the ACHP has issued a program comment that offers alternatives to the traditional Section 106 process when dealing with magazines and other ammunition storage facilities (see Appendix C).
- Small prefabricated steel buildings of plain gabled design. These buildings were mass-produced by several different steel-producing companies, including Star Manufacturing and Butler Manufacturing. Used for storage, as maintenance shops, and for a wide variety of other uses, these facilities are often referred to as "Butler Buildings" because of the prevalence of the Butler types. These buildings generally have a low level of architectural significance and are extremely common. However, please note that larger buildings by Butler Manufacturing, such as 1950s-era fighter-aircraft alert hangars, may be more significant.

Please note that it is possible that some of these small utility or prefabricated buildings could be eligible for the National Register in some cases as minor contributing properties in historic districts made up of larger, more important buildings.

Figure 1. Building 34040, Former Water Treatment Facility (built 1960), Wright-Patterson Area A
Photo by Leann Gehlke, Hardlines Design Company, 2008

These small buildings have a very low level of architectural significance and are usually accommodated infrastructure items like water or sewage pumps, water-treatment equipment, or electrical generators. These buildings generally do not have enough architectural merit for National Register eligibility for architectural design, and they are also likely to have a low level of overall historical significance because of their fairly mundane functions. This building began as a water-treatment building, but all equipment has since been removed and it is no longer used for that purpose.

Organization of This Guide

This report is organized into the following sections:

Historic Context: Modernism in U.S. Military Architecture Up to 1975

- Briefly summarizes the early history and development of architectural Modernism in Europe and the United States.
- Covers the early development of Industrial Modernism American military architecture during World War I through the 1930s.
- Discusses other early Modernistic styles used for American military architecture, with particular emphasis on Art Deco and Art Moderne.
- Describes the early influence of high-style European Modernism on American military buildings of the early World War II era (ca. 1940–1943).
- Reviews the growing dominance of Modernist design in military architecture of the post-World War II era, with a strong emphasis on the influence of Mies van der Rohe
- Discusses the continued development of Modernism in the mid to late 1950s and the 1960s, reviewing the design and construction of the U.S. Air Force Academy.
- Concludes with architectural movements that made their way into military architecture in the 1960s and that in many cases stayed influential through the first half of the 1970s; the movements discussed are New Formalism, Brutalism, and Expressionism.

Eligibility for the National Register of Historic Places

- Includes a brief, general introduction to the National Register Criteria A–D, and provides a more detailed discussion of National Register Criterion C, which covers architectural, artistic, and engineering significance, and is the criteria most relevant to architectural Modernism.
- Examines special considerations for the National Register, which are known as criteria considerations, and reviews all of the criteria considerations that might be applied to Modernist military buildings, with special emphasis on Criteria Consideration G, for properties that are less than fifty years of age or that have achieved significance during the last fifty years.
- Refers to ACHP program comments (provided in Appendix C).

Evaluation Guidelines

- Summary of Important Movements and Their Characteristics

  Discusses the most influential architectural movements of the 1950–1975 years (such as Miesian, Brutalism, New Formalism, and Expressionism), and describes how each of the important movements has appeared in DoD architecture, and lays out which features are character-defining ones.

- Assessing Integrity in Modernist Properties

  Covers special integrity issues that may arise when surveying Modernist buildings from the 1950–1975 era
- Reviews the National Register's seven aspects of integrity and covers how they might specifically be applied to Modernist properties

Researching Modernist Properties

Provides sources that are valuable for researching military buildings, including on-base sources like construction drawings, property record cards, history office files, archival photographs, and base newspaper articles, and off-base sources like articles in newspapers or architectural journals.

References Cited

Full bibliographic entries for all text citations in the main body of the report (note that the sample assessments in Appendix A have their own source list).

Sample Assessments of Six Buildings at Wright-Patterson Air Force Base (Appendix A)

Examples of National Register eligibility evaluations for a number of buildings at Wright-Patterson (official National Register recommendations are not given as that is not the scope of this project). Each assessment includes a description, history, photographs, and National Register Criterion C discussion for each building.

Sources Useful in Assessing Cold War Historic Significance of Military Buildings (Appendix B)

A list of useful sources for evaluating the military significance of Cold War DoD buildings

Copies of ACHP Program (Appendix C)

Documents providing alternate procedures for dealing with barracks dating to 1946–1974 and ammunition storage buildings from 1939–1974:

- *Program Comment for Cold War Era Unaccompanied Personnel Housing (1946–1974), 2006*
- *Program Comment for World War II and Cold War Era Ammunition Storage Facilities (1939–1974),* 2006

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HISTORIC CONTEXT: MODERNISM IN U.S. MILITARY ARCHITECTURE UP TO 1975

Introduction

Much has been written on the history of modern architectural movements in the United States, and the influence Modernism had on the American built environment in the mid to late twentieth century. This context seeks to establish the type of influence that modern architecture has had on the buildings of the armed services in the United States, with the hope that this context can serve as a useful guide for showing how Modernism affected military design during the defined period. This context begins with some general explanations and a brief history of architectural Modernism, and then discusses specifically how Modernism affected defense-related architecture during the twentieth century, up to 1975. The primary focus is on the building types that are specifically covered in this study (administrative, laboratory, and training buildings), but building types such as hangars and family housing are included when these property types are critical to the understanding of the evolution of Modernism in American military architecture.

Although "Modernism" is a fairly broad term that covers a wide variety of architecture of the twentieth century, some characteristics and tendencies are common to most Modernist buildings. In general, most Modernist designers rejected the ornament that was typical of much of the architecture of the middle and late nineteenth century, opting instead for plainer designs that focused on the function of the building and, in many cases, exposed the structural parts of the building instead of covering them with decorative finishes. In the nineteenth century, buildings were usually solid enclosures with four or more walls punctuated with windows, but Modernist designers began to view buildings as skeletal frames that shaped space. To many Modernist designers, eliminating ornament and exposing structural elements was viewed as a very honest, ethical, and efficient way to design. The use of flat rooflines, cubic forms, and relatively modern materials for the time—such as glass, structural steel, and reinforced concrete—were all favored. This new way of thinking about buildings developed as technologies and ideas changed from the mid-nineteenth century through the early twentieth.

Overall, this report covers the years of 1950 to 1975, but this context begins in the mid 1800s so as to give you a sense of the origins of the trends and tendencies in military architecture leading up to the 1950–1975 years. Also included is important general background on the development of Modernism in Europe and the United States in the early twentieth century. This context is organized into the following sections:

- Origins of Modernism in Europe and the United States (1890–1933).
- Introduction to Modernism in U.S. Military Architecture.
- 1917–1934: Industrial Modern.
- 1935–1945: Art Deco, Art Moderne, and the Stripped Classical Style.
- 1941–1946: World War II—The Introduction of European Modernism to the U.S. Military.
- 1947–1954: Postwar Modernism in Military Architecture.
- 1954–1963: Later Modernism and the U.S. Air Force Academy.
- 1964–1975: New Movements Reach the Military—Brutalism, New Formalism, Expressionism.

The characteristics of each of the styles discussed is presented beginning on page 95.

1890–1933: Origins of Modernism in Europe and the United States

The ideas that formed the basis for Modernism originated in Europe and the United States. Some of the earliest antecedents for architectural Modernism arose in Europe in the nineteenth century and mostly centered around the concept of reducing architecture to its basic structural elements. For example, around the middle of the nineteenth century, several architectural theorists in Germany and France developed the idea that architecture should not imitate past styles. Designers and theorists like Viollet LeDuc, Heinrich Hubsch, and Gottfried Semper explored the idea that there could be a new architectural style that reflected modern technological advances, such as structural iron and plate glass. Some of these theorists felt that the architecture of the past could be used as a source of inspiration but architects should not make exact copies of the past sources. Instead, designers should use creativity and modern materials to transform the characteristics of past architectural styles like Renaissance, Gothic, or Romanesque into something new that unmistakably reflected the spirit of technological advancement of the nineteenth century (Curtis 1996:24).

The English Arts and Crafts movement is also often seen as one of the sources of Modernism; this movement was composed of a group of architects and designers who rejected the late-Victorian tendency toward ornate, heavy designs and embraced simpler designs for buildings and furniture, using materials in an "honest" way, avoiding any practices that might appear deceptive. For example, they rejected common practices such as using painted faux finishes to make cheap softwoods look like expensive mahogany or walnut, or painting interior plaster columns to resemble marble. The movement valued handcrafted items and criticized low-quality, poorly designed mass-produced goods. The Arts and Crafts movement had its origins with designers like William Morris, who were active from the 1850s through the late nineteenth century, and matured with designers such as Charles Rennie Mackintosh of Scotland, who did significant design work during the 1890s, up into the early years of the twentieth century (Frampton 1992:43–45).

By the end of the nineteenth century, some designers in both Europe and the United States were moving toward simplicity and integrating structural features into building design. The development of steel and reinforced-concrete structural frames for buildings was one of the major driving forces in this movement. In the United States, late nineteenth-century designers like William Le Baron Jenney, Dankmar Adler, John Wellborn Root, and Louis Sullivan pioneered the use of structural steel framing; this use of steel began to be reflected in the exterior appearance of tall buildings. For example, Root's Reliance Building (1894–1895, Figure 2) in Chicago has an exterior of thin wall surfaces supporting large expanses of glass, giving the building a skeletal appearance.

Around the same time, Louis Sullivan promoted the idea that the interior steel structure of a tall building should be visually reflected in the design of the building's exterior. Sullivan expressed this idea in works such as the 1890–1891 Wainwright Building in St. Louis, a joint project involving Sullivan and Dankmar Adler (Frampton 1992:52–55).

Figure 2. The Reliance Building (built 1894–1895), Chicago, designed by Burnham and Root
Photo from the Historic American Buildings Survey collection, ca. 1980s

The fairly large windows allowed by the steel frame give the building a light, skeletal feel when compared to the more solid-looking building exteriors that were more common during the early 1890s and before.

The 1890s also brought the development of reinforced concrete for structural framing, both in Europe and the United States. Reinforced concrete could span wide spaces—allowing buildings with thin structural frames—and could be molded into a variety of different shapes. By 1905, Auguste Perret designed a building in Paris (the Garage at 51 Rue de Ponthieu) in which the reinforced-concrete frame was very plainly exposed on the building's exterior. In contrast, earlier buildings had covered the structural frame with a veneer of brick, stone, terra-cotta, or other materials (Curtis 1996:24).

The development of Modernism continued in the United States with the early twentieth-century work of Frank Lloyd Wright, who worked with Louis Sullivan during the early part of his career. Wright developed his own distinctively modern approach to design with his Prairie-style dwellings such as the Robie House in Chicago and his 1906–1908 Wescott House (Figure 3), a private residence in Springfield, Ohio. Wright's innovations include simple designs with limited ornament, innovative use of reinforced concrete, and open floor plans. Wright's work is also characterized by careful management of the flow of natural light into the building, which he achieved through precisely placed windows aided by roof overhangs that could block sunlight from the interior when it was not needed. Wright also showed a great sensitivity to blending the building into its surrounding landscape.

Figure 3. The Wescott House (built 1906–1908), Springfield, Ohio, designed by Frank Lloyd Wright
Photo by Roy Hampton, Hardlines Design Company, 2012
The exterior of this building is composed of large bold horizontal masses, and ornament is used sparingly.

The more simple design approach continued into the twentieth century in Europe through designers like Adolph Loos of Austria and Peter Behrens in Germany, who is best known as a designer of industrial buildings (Frampton 1992:92–93, 110–112). One of the most significant developments in the history of Modernism was the founding of the Bauhaus in Germany in 1919. The Bauhaus was a design school dedicated to developing and promoting architectural Modernism, and the school trained many architects and designers of industrial products and furniture. The Bauhaus approach featured cubic forms with simple, smooth surfaces and exposed structural frames, and the buildings often had a precise, machine-made look. Bauhaus designers also created furniture and other objects for the home, which were carefully proportioned and designed but also practical, easy to clean and maintain, and in many cases, able to be produced at a low cost (Frampton 1992:126–128). The Bauhaus was founded by architect Walter Gropius, who served as the school's first director. Ludwig Mies van der Rohe (Mies), another influential German architect, would also serve as a director of the school. Other eminent Modernist architects actively involved in the Bauhaus were Marcel Breuer and Adolf Meyer (Frampton 1992:123–126). When the Bauhaus relocated to the city of Dessau in 1925, Gropius designed a new building for the school, which was constructed in 1926.

The influence of the Bauhaus, and European Modernism in general, spread to a handful of designers in the United States during the 1920s, although most architects continued to use a more traditional style. The 1920s were a time in which the highly traditional Colonial Revival flourished in the United States, and mainstream design continued to be fairly conservative. However, some American designers, such as California's Richard Neutra, absorbed Bauhaus influence and then developed distinctive designs. Neutra was influenced by the cubic forms of European Modernism but developed his own approach in the 1920s and 1930s, which emphasized the integration of indoor and outdoor spaces and extensive use of glass. Frank Lloyd Wright and Louis Sullivan were somewhat marginalized during this time by the resurgence of traditional design, but both men continued to work on small projects during the 1920s and early 1930s.

While the conservative Colonial Revival style was strong in the United States during the 1920s and early 1930s, Modernism was gaining ground in Europe at that time, where it was frequently referred to as the International Style. The concept of the building as a structural steel or reinforced-concrete frame with an exterior skin of glass (known as a "curtain wall" because the wall did not bear any weight) was developed and refined during this time in Europe. Major architects of European Modernism in the 1920s and 1930s were Mies, Gropius, Breuer, and the French designer Le Corbusier, who was particularly strongly associated with the development of reinforced concrete in Modernism.

The brief heyday of European Modernism ended with the rise of Hitler and other totalitarian leaders in Europe during the 1930s. The Fascists were suspicious of the intellectual nature of Modernism and judged it to be subversive. Adolf Hitler's government closed the Bauhaus in 1933, and Germany became an inhospitable place for those affiliated with the school. As a result, many of European Modernism's great designers, including Mies, Gropius, and Breuer, relocated to the United States, where some were hired by architecture schools at major universities.

Introduction to Modernism in U.S. Military Architecture

The authors of this study are not aware of any U.S. military buildings dating to 1900–1916 that reflect the strong influence of early European Modernism or the designs of American Modernists such as Frank Lloyd Wright. In general, the innovative ideas of Wright and European Modernism appear to have been too experimental to be adopted by the United States military in the years before and during World War I. Although the military did not accept high-style European or Wrightian Modernism during World War I, it did begin at that time to embrace an American form of Industrial Modernism that centered on factories and warehouses; these initial industrial buildings are a good starting point for discussing a modern approach to design in the U.S. armed forces.

1917–1934: Industrial Modern

Some of the earliest military buildings in the United States that can be considered to reflect a modern design sense were buildings designed by or influenced by Albert Kahn, a German-born American architect. Kahn arrived in the United States as a young man in the 1880s, settling in Detroit. By 1908, Kahn was using reinforced-concrete frames to construct

automobile factories that were highly practical in design. Kahn's automobile factories featured plain brick and concrete exteriors punctuated by fairly large expanses of steel-sash windows, flat rooflines, and little or no exterior ornament. The reinforced-concrete structural frame permitted open interiors that could house assembly lines and be used in a flexible manner to suit changing manufacturing processes (Curtis 1996:81). Kahn's factories were also known as "daylight factories," since reinforced-concrete framing also allowed for large amounts of glass, including expanses of steel industrial windows. Various forms of skylights were also incorporated.

Kahn's design approach was restrained and practical, and the public began to link him with the idea of factories and mass production. He came to be known for building factories where the *function* of each building was the main concern, rather than appearance or adherence to a particular architectural style. The relatively inexpensive reinforced-concrete frame construction and plain architectural character of the buildings also kept construction costs low. Kahn's firm was involved with designing military installations and war-related factories during World War I, so the firm developed strong connections with the U.S. military. The Aero Repair Building (Building 777) at Langley Field (now Langley Air Force Base) in Virginia is attributed to Albert Kahn (see Figure 4). Built in 1919, the building contains decorative brickwork in the gables, but other than this pattern work, the overall architectural form is simple, with a gabled roof, brick walls, and large windows.

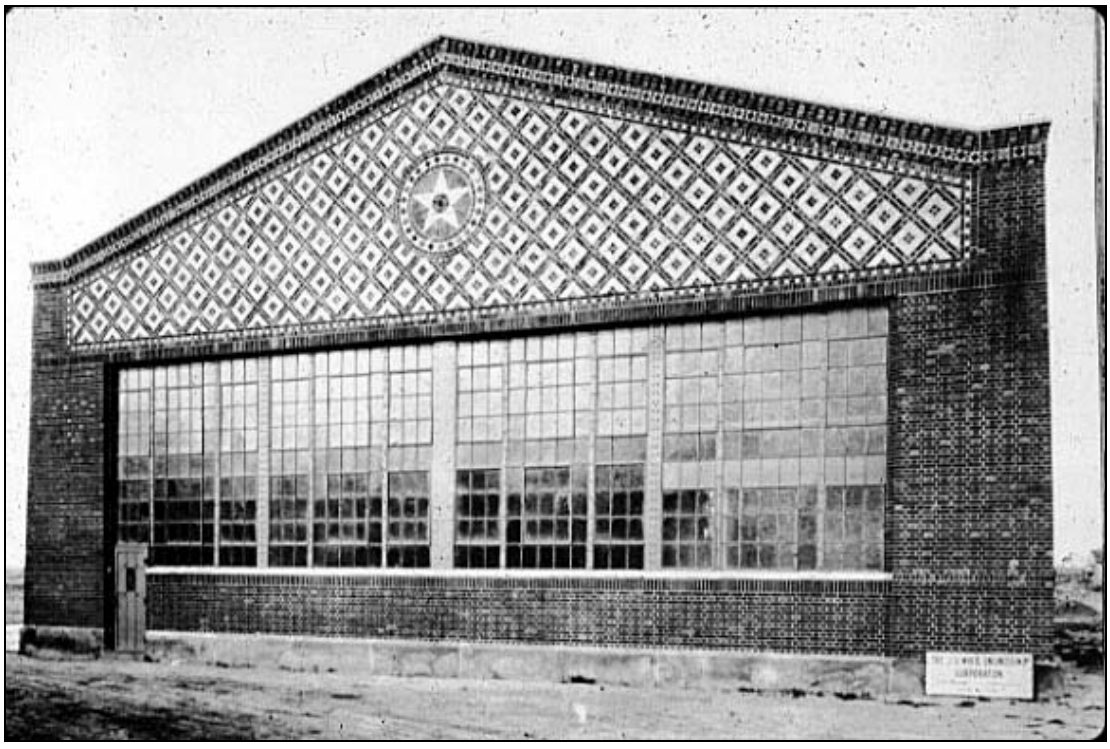

Figure 4. Aero Repair Building (built 1919), Langley Field (now Langley Air Force Base), Virginia, designed by Albert Kahn

Photo provided by the Air Combat Command History Office

Although the building has fairly elaborate polychromatic brickwork, the overall form of the building is simple, with large amounts of glass, reflecting Kahn's industrial aesthetic.

Kahn's practical approach influenced U.S. military architects. The design of buildings at U.S. Army installations in the 1920s was handled by the Office of the Quartermaster General's Construction Service (the Quartermaster General). Albert Kahn's influence on Quartermaster General designers during the 1920s is especially visible in the buildings of Wright Field, a U.S. Army Air Corps installation near Dayton, Ohio, (named after the Wright Brothers) that is now known as Area B of Wright-Patterson Air Force Base (Wright-Patterson).

The Quartermaster General's construction correspondence for Wright Field from the 1920s contains little discussion of architectural style and mostly expresses concern with efficiency and budget, an attitude similar to the one Kahn held when designing factories. Early 1920s illustrations of what the Quartermaster General envisioned for Wright Field show factory-like hangars and shop buildings with large expanses of glass.

Wright Field's Administration Building (Building 20011, built 1925–1926, Figure 5) was designed by the Quartermaster General's office with a simple flat-roof configuration similar in some ways to Kahn's factory designs of ca. 1908–1920. The building was very plain, with a reinforced-concrete frame, poured-concrete exterior walls, and almost no ornament of any kind. A terra-cotta emblem of Rodin's sculpture *The Thinker*, a symbol of the air materiel operation that was to be headquartered in the building, appears to be one of the only purely ornamental features on the building's exterior. A low, one-story section of the Administration Building included a sawtooth roof to provide an abundance of natural light on the interior.

Figure 5. Building 20011 (built 1925–1926), Wright-Patterson Area B, designed by the U.S. Army's Office of the Constructing Quartermaster
Photo by Roy Hampton, Hardlines Design Company, 2011
The building has a reinforced-concrete structural frame and a simple concrete exterior with almost no ornamentation. The windows visible in the photograph are replacements; the original windows would have been steel industrial units with mullions.

In addition to the plain design of the Administration Building, a significant number of laboratory and test buildings at Wright Field were designed in a simple, industrial style. These buildings feature symmetrical flat-roofed or gabled compositions, plain brick walls, a minimum of ornament, and large grid-like expanses of industrial windows; the buildings are often categorized as examples of the Wright Field style. These buildings (see Figure 6) resemble less-ornamented versions of Kahn's World War I hangars at Langley, and are also similar to buildings at Kahn's factories. Examples of the Wright Field style at Wright-Patterson Area B are Buildings 20017 (1927), 20018 (1928), 20023 (1934), 20032 (1927), 20038 (1932), and 20039 (1929). The Wright Field style continued to be used by the U.S. Army Air Corps at Wright Field well into the 1930s.

Figure 6. Building 20039 (built 1929), Wright-Patterson Area B, designed by the U.S. Army's Office of the Constructing Quartermaster
Photo by Leann Gehlke, Hardlines Design Company, 2008
The use of low-pitched gables, brick walls, and large industrial windows on this building is very similar to the 1919 Aero Repair Building by Albert Kahn shown in Figure 4. In this case, the U.S. Army Air Corps omitted the polychrome brickwork, giving the building a plain appearance typical of buildings constructed at Wright Field in the 1920s and early 1930s. This type of construction is known at Wright-Patterson as the Wright Field style. A large number of these buildings remain at Wright-Patterson and continue to be used by the U.S. Air Force for a variety of functions.

The U.S. Army Air Corps was not the only part of the military to adopt an industrial modern approach to design during World War I and the 1920s. A practical approach to design is also in evidence at the Brooklyn Army Depot, which was constructed ca. 1918 in Brooklyn, New York. The designer of this large U.S. Army building was Cass Gilbert, an eminent New York

architect known for ornate Renaissance Revival state capitals and the Gothic-ornamented Woolworth Building in New York City. In contrast to these traditional buildings, Gilbert's work at the Brooklyn Army Depot shows a very stripped-down, functional style (see Figure 7). The terminal's large main building is a flat-roofed facility with a fairly plain exterior. Gilbert made extensive use of reinforced-concrete slabs in the construction, which reduced the need for steel structural posts and beams. The large main building of the depot survives today.

Figure 7. Brooklyn Army Depot (built 1918), New York City, designed by Cass Gilbert
Photo by Rob Tucher, Historic American Engineering Record, 1991
This building has minimal detail and an industrial quality that is similar in spirit to the work of Albert Kahn.

Another practical innovation of the U.S. military in the World War I era was the development of standard architectural drawings for common building types that had to be constructed quickly to meet the needs of rapid wartime expansion. One advantage of standard plans was that a new set of architectural drawings did not need to be made each time a new building was constructed. A second advantage was that these buildings could be constructed out of standard cuts of wood that could be mass produced and obtained easily. Mass-production of wood-frame buildings had appeared in the private sector around the World War I era, in the form of wood-frame single-family houses and duplexes that could be ordered from catalog companies like the Sears & Roebuck Company. The standard plans were a way in which the military adopted efficiencies that were developed as part of private-sector industrial mass production.

The Industrial Modern U.S. military architecture built during World War I and the 1920s is very different from the European Modernism of the Bauhaus or the work of American Modernists such as Wright or Neutra. The focus of the military's industrial-style architecture was practical; function and low construction costs were the main considerations. For Wright, Neutra, and the designers of the Bauhaus, function and cost were important, but these designers were also trying to make bold architectural statements. Bauhaus designers and some American architects engaged in daring and unconventional use of glass, cantilevered construction, or thin skeletal steel or reinforced-concrete construction that seemed almost weightless. For the most part, the military was not interested at this time in such stylistic statements, and although the Industrial Modern style of the U.S. military was advanced for its time, the features of the buildings were designed with mainly practical considerations and did not strive to make daring visual statements. The architecturally bold aspects of Modernist design would not appear in U.S. military architecture until the eve of World War II.

1920–1945: Art Deco, Art Moderne, and the Stripped Classical Style

While the Industrial Modernism of Albert Kahn continued to influence U.S. military design up into the mid-1930s, other areas of Modern design in the 1920s and 1930s were also affecting military architecture. These movements featured more abstract simplified designs in which ornament and the overall forms of the building were given over to simpler geometrical shapes:

- The Art Deco style, which had its initial period of influence in the 1920s, used stepped shapes and ornament with a strong geometrical quality. This style continued to influence American architecture during the 1930s but began to be supplanted by the Art Moderne style in the 1940s.
- The Art Moderne style belongs to the 1930s and 1940s and was primarily based on the idea of streamlining, the concept that the design of vehicles like automobiles and locomotives could convey the concept of speed through the use of horizontal lines and sweeping curved forms. Such streamlined forms were applied to buildings, most commonly for commercial, office, and industrial buildings, since it suggested that the occupants of the building were forward thinking and technologically advanced.
- The Stripped Classical style featured fairly plain buildings decorated with highly abstract, simple Classical ornament, and this style was most often used for government buildings.

These styles, discussed below, are grouped together because they belong to the 1920–1945 time period, and because they all involve, to a greater or lesser degree, a sense of simplification or abstraction of form and ornament.

Art Deco

The Art Deco style is generally marked by stepped forms, including massing in which the building is composed of a series of blocks that step up to higher levels. The style also features using metals for decoration, geometrical simplification of ornament in some cases, and curved forms. Ornament is commonly used on the buildings, although the style is typically less ornate than traditional styles like Spanish Revival. The aerodynamic design of automobiles and

aircraft influenced Art Deco, so some Art Deco objects and buildings do have streamlined elements in their designs.

The Art Deco style was used extensively for commercial architecture in the 1920s and for some buildings associated with state, federal, and local governments. Well-known examples of the style are the Chrysler Building in New York City (William Van Allen, 1929) and the 1931 Cincinnati Union Terminal (designed by Alfred Fellheimer, Steward Wagner, Paul Phillipe Cret, and Roland Wank). Many office towers and other private-sector buildings in the Art Deco style survive from the 1920s. Sometimes traditional Greek and Roman Classical elements were also included to add a more traditional character (Frampton 1992:219); this tendency is discussed further under the discussion of the Stripped Classical style, beginning on page 26.

Although the Art Deco style had some influence on United States military architecture, it was limited by a several factors. The 1920s were a decade in which thousands of commercial buildings were designed in the Art Deco style, but this decade was also a time when the U.S. military was in a state of retrenchment after the rapid expansion of World War I. In many cases, existing World War I-era buildings were used, and new construction was avoided. Several international arms limitation treaties of the 1920s kept a lid on the expansion of the U.S. military during that decade as well. As a result, fairly few Art Deco military buildings were constructed during the 1920s.

Military construction also proceeded at a fairly slow pace during the early and middle 1930s, a time during which Art Deco was still a popular architectural style in the United States. Of the relatively small number of military buildings constructed during this time, many were built in more traditional styles, mainly the Spanish Revival and Colonial Revival styles. Still, some military buildings of the early to mid-1930s were designed with Art Deco influence, most notably the early 1930s hangars at the Army Air Corps' Randolph Field, in Texas. A barracks and several shop buildings constructed in the mid-1930s at the Puget Sound Navy Yard at Bremerton, Washington, also show evidence of stepped Art Deco forms.

By 1938, a full-scale revival of military construction was underway in the United States because of the threat of Nazi expansion and the looming possibility of war in Europe. But by this time, Art Deco had faded in popularity and was in many cases rejected by the military in favor of traditional architectural styles or the streamlined but less-ornamented Art Moderne style (discussed next).

A good example of government Art Deco design at Wright Field is the Technical Data Building (Wright-Patterson Building 20012, Figure 8), constructed in 1934–1935. Although the project to build this building was overseen by the U.S. Army Office of the Constructing Quartermaster, the building was designed by eminent Dayton architects Albert and Freeman Pretzinger, who had designed many prominent buildings in Dayton in a variety of architectural styles from ca. 1905 onward. The Technical Data Building is restrained in design on the exterior but has a sense of symmetry and mass that is somewhat Classical. The use of a gabled front portico with stone pilasters strongly suggests Classical influence, and the building's exterior ornament also hints at Greek and Roman Classicism, but the forms of the ornament clearly reflect the influence of Art Deco simplification. For example, although the front doors of the building include relief sculptures of eagles, a traditional Roman symbol, the

eagles are designed in an abstract, geometric style (see Figure 9). Also, these doors and most of the interior metalwork in the building are executed not in traditional bronze, but in modern aluminum, a silver metal that carries technological associations with the bright metal fuselages of 1930s aircraft. The building's interior features a central rotunda with a skylight and is appointed with dark wood veneer on the walls and an abundance of Art Deco ornament in geometrical patterns (see Figure 10).

Figure 8. Building 20012 (built 1934–1935), Wright-Patterson Area B, designed by Albert and Freeman Pretzinger, view of main entrance

Photo by Leann Gehlke, Hardlines Design Company, 2008

The stepped parapets, stylized eagle and wing motifs, and overall sense of simplification on this facade reflect the Art Deco aesthetic. However, the use of a portico with two fluted pilasters and two fluted posts gives the front of the building a somewhat Classical air that was deemed appropriate for government-related buildings in the 1930s. Note: The Air Force has fitted this building with more appropriate multi-pane windows since this photo was taken.

Art Deco influence continued at Wright-Patterson into the World War II years, although the buildings were plainer than Building 20012, with less ornament. For example, Wright-Patterson Buildings 20014 (Figure 11) and 20015 were built in 1942–1943 to house Air Materiel Command offices. These twin, two-story, L-shaped buildings are of poured concrete and have mostly plain exteriors, but the entrance bays are stepped up slightly higher than the rest of the buildings, giving the buildings a stepped Art Deco character. Most of the exterior wall surfaces of the buildings are plain, but some ornament is concentrated near the entrances. On the entrance bays, ornament was pressed into the concrete, including a stepped frieze at the top of the entrance bay, and a projecting register of vertical lines over the main entrance.

Figure 9. Building 20012, front entrance double doors
Photo by Roy Hampton, Hardlines Design Company, 2011
The details of this building show a strong sense of Art Deco streamlining and the style's tendency to include geometrical ornament.

Figure 10. Building 20012, detail of interior skylight
Photo by Leann Gehlke, Hardlines Design Company, 2008
Art Deco geometry is also strongly evident in the interior details of this building.

Figure 11. Building 20014 (built 1943), Wright-Patterson Area B, designed by Sverdrup & Parcel, Engineers, and J. Gordon Turnbull, view of entrance bay
Photo by Roy Hampton, Hardlines Design Company, 2011
The stepped geometrical massing and use of vertical linear ornament indicates that the Art Deco style still had some influence in the first half of the 1940s. Building 20014, however, is more abstractly linear in its form and ornament and does not feature any of the hints of Classical design seen in Building 20012, below.

Thumbnail (above) of Figure 10 (Building 20012, reproduced here to facilitate comparison

It is useful to compare Building 20012 with Buildings 20014 and 20015 (see Figure 11), to illustrate how the Art Deco style was expressed differently during wartime. The two World War II-era buildings lack the sculpted eagles and wing motifs seen in the 1930s design of Building 20012. The ornament on Buildings 20014 and 20015 is limited to linear patterns and other abstract geometrical motifs that would be fairly easy to execute in poured concrete. Buildings 20014 and 20015 were also built with less expensive materials, in keeping with the more spare wartime aesthetic. Buildings 20014 and 20015, for example, lack the stone veneer placed on the exterior of Building 20012 and instead feature poured-concrete exteriors, a situation that allowed for faster and cheaper construction. This restrained wartime poured-concrete Art Deco style is known at Wright-Patterson as the "Army Art Deco style."

Art Moderne

Art Moderne, also sometimes referred to as Streamline Modern, was one of simplification of forms, and like other Modernist movements, it strove to create a new style of design instead of looking back to the past. Streamlining was a very strong element in this style, and because Art Deco and Art Moderne both contain elements of streamlining and simplification, they are often discussed together. The two styles are related, as both grew out of the machine aesthetic of the 1920s and 1930s. However, the emphasis in each style is different, with Art Deco often

including more ornament and more use of stepped forms, and Art Moderne featuring less ornament and more reliance on streamlining for visual effect.

The Art Moderne style is generally characterized by plain buildings that have little or no ornament. If ornament is used, it is often not sculptural but consists of flat patterns of materials such as tile or brick. The buildings are strongly influenced by streamlining, a technique in which unbroken horizontal lines and forms, and sweeping curves, are used to give a sense of speed and sleekness. The style is also characterized by half-circle and quarter-circle corners and bays, strong horizontal lines, long ribbon-like stretches of windows, and materials like brick, glazed terra-cotta, aluminum, chrome, tile, and glass block.

Because the structural frames for these buildings were of steel and reinforced concrete, the windows could be unusually large, and large expanses of glass often characterized the exteriors. The style was used commonly for office, commercial, and industrial buildings. The streamlined feel of the buildings had a highly modern look in the late 1930s, and could give companies a cutting-edge, up-to-date image. The lack of ornament meant construction costs were lower than more traditional styles like Spanish Revival.

With the growing threat of war in the late 1930s, all branches of the U.S. military were expanded, and new bases were constructed, as well as new permanent buildings at existing installations. A large wave of permanent military construction began around 1938 and continued through about 1943. Once the United States entered World War II at the end of 1941, more labor and energy was directed toward building ships, aircraft, vehicles, and weapons, and by 1943, most of the permanent military construction projects were ones that were necessary for the war effort. The military construction of the late 1930s and early 1940s utilized traditional architectural styles like Colonial Revival, but the streamlined Art Moderne style was also commonly applied.

Many examples of buildings that show the influence of the Art Moderne style have survived at Wright-Patterson; most date from the early World War II years. Building 20008, 20014, and 20015 are clearly examples of the style. For example, Building 20008 (1942, Figure 12) contains dramatic horizontal expanses of glass that bend into streamlined curves. Ornament is present but sparse, consisting of some grooves, textured friezes, and simple recessed panels that were molded into the concrete as it was poured.

Articles on these Art Moderne buildings at Wright Field were published in concrete construction journals of the time, touting the modernity of concrete and its wartime advantages over scarce steel, which was needed for ships, tanks, and aircraft. In one such article, the buildings were described stylistically as “modern with simple details” (*Architectural Concrete* 1945:4), and the designers of the buildings were characterized as “eliminating frills and doodads, getting the most out of materials at hand, and getting the job done now” (*Architectural Concrete* 1945:3). A simpler, more modern approach to design fit wartime sensibilities in multiple ways: the simple forms were seen as forward thinking in terms of aesthetics, and the elimination of ornament lowered costs and made for faster construction.

Figure 12. Building 20008 (built 1942), Wright-Patterson Area B, designed by the U.S. Engineer Office, Wright Field, Ohio, detail of curved bay and tower showing Art Moderne influence
Photo by Roy Hampton, Hardlines Design Company, 2011
The simple, bold massing of the building, the very spare use of ornament, and the sweeping curved bay in the foreground with two horizontal unbroken rows of ribbon windows are characteristic of the Art Moderne style.

Wright-Patterson's Building 20065 (Figure 13), a large hangar-like test laboratory built in 1944, is fairly plain and cubic in design, reflecting the restrained simplicity of Art Moderne, but it does not contain any of the curved features seen in Building 20008. The exterior of Building 20065 has no ornament other than a star motif on the front of the building and a few simple lines in the concrete. This metal and poured-concrete building was another of the large facilities built quickly at Wright-Patterson during the 1940s to fill expanding wartime needs.

The Navy and Marine Corps also commissioned some designs that used the curves and horizontal lines of the Art Moderne style. In 1941, Albert Kahn and his firm were commissioned to design administrative buildings, barracks, and support buildings at Marine Corps Base Hawaii. The buildings included Building 215 (Figure 14), now the Judge Advocate Building (U.S. Marine Corps 2009:36), which features a painted concrete exterior, horizontal lines with deep overhanging elements, and a distinctive corner with curved walls and windows.

Figure 13. Building 20065 (built 1944), Wright-Patterson Area B, designed by Hazelet & Erdal, Engineers
Photo by Hardlines Design Company, 2008
The exterior of this building is bold and massive, composed of steel, glass, and poured concrete, and contains a minimal amount of ornament. Although it reflects Art Moderne simplification, it does not feature any of the curved forms that are often found in Art Moderne buildings.

Figure 14. Administrative Building, now Judge Advocate Building (built 1942), Marine Corps Base Hawaii, designed by Albert Kahn
Photo by David Franzen, Historic American Buildings Survey, 2006
Although this building is smaller than the portion of Building 20008 that is reproduced in Figure 12, the massing is somewhat similar, and both buildings feature a two-story wing with a half-circle curve and ribbon windows that wrap around the curved portion of the building.

Stripped Classicism

Stripped Classicism is a general term used in architectural history to describe any building that is Classical in design (inspired by Greek, Roman, or Renaissance sources) but fairly plain, with the Classical elements simplified and often sparsely applied with minimal detail. Very plain Classical designs were executed for buildings during the late eighteenth and early nineteenth-century rise of the Neoclassical movement, in which designers were looking back to the designs of ancient Greece and Rome, to achieve a style that more purely reflected the architecture of the ancient world.

Some English and Australian publications apply the term Stripped Classicism to any twentieth-century building of a simplified Classical design. In this guide, the term has a more specific meaning. The term Neoclassical Revival is used in this context to cover pre-1930s buildings that show Classical influence. For the purposes of this context, the Stripped Classical term is specifically reserved for the large number of government-related buildings constructed during the late 1930s and 1940s that are plain and rectilinear in form but have some very restrained Classical elements, such as simple pilasters, cornices, and entablatures. The Classical elements give the buildings a sense of dignity and connection to the past that is often associated by the public with the idea of government. The buildings are also usually planned in a symmetrical form, which also reflects Classical influences. The Stripped Classical style combines Modernism's tendency toward simplicity with a traditional sense of Classical design. Buildings in this style differ from Art Deco and Art Moderne buildings with Classical detail in that Stripped Classical buildings are generally more block-like in form and do not have the streamlined semicircular curves and stepped forms of the Art Moderne and Art Deco styles.

The combination of fairly simple building form and Classical ornament was used for many government buildings of the 1930s in the United States, since it combined aspects of both traditional and modern design. Bauhaus and other European Modernist design was seen by the U.S. government as too experimental and controversial; the elements of avant-garde European Modernism associated with the International Style and the Bauhaus were abstract, devoid of ornament or references to the past, and highly intellectual in nature. These architectural forms were not well suited for government buildings, which sought to project a modern and progressive image but also needed to evoke the qualities of permanence and tradition that were associated with the empires or early democracies of ancient Greece and Rome.

Streamlined buildings with Classical elements were modern in form but were also able to incorporate the Classical architectural elements that had long been associated with the intellectual and political power of the ancient world. This merging of simplified modern form and traditional Classical decorative elements and symmetry appeared in both Europe and the United States in the 1930s. The style was strongly favored for government buildings and was also used at times for military buildings (Frampton 1992:220–223).

The largest and most important example of a U.S. military building that combines a sense of modern practicality with fairly minimal Classical ornament is the Pentagon, built in 1941–1943. Although the overall building is plain and industrial in its character, the five exterior walls are veneered in stone and dressed up with sparse Neoclassical Revival detail to provide a sense of Classical dignity (Luce and Sherfy 1998:10).

Persistence of Traditional (Non-Modernist) Styles

Not all military designers embraced the simplified architectural styles of the 1930s and 1940s. Many Army, Navy, and Marine Corps facilities of the 1930s and early 1940s reflected more ornate popular traditional architectural styles that referred to the past rather than appearing modern. This was especially true for family housing and chapels, which were seen as building types that should be more traditional in character. This trend in military architecture reflected an overall trend in the United States from the 1920s in which there was a strong fascination with architectural styles that reflected the nation's Colonial past. These architectural styles, known by names like Colonial Revival, Georgian Revival, and Spanish Revival, were especially popular with the U.S. military as they reflected the early history of the United States. Georgian Revival and Spanish Revival buildings were constructed at many military installations during the late-1930s U.S. military buildup, up into the World War II years of the 1940s.

Some architects active from the 1920s through the 1940s were ethically committed to Modernism and refused to design buildings in traditional styles like Georgian Revival that were popular at the time. However, a large number of architects active during those decades saw no ethical problems with designing modernistic factory and commercial buildings but then applying highly traditional styles to housing and other building types. For example, from about 1908 through the 1940s, Albert Kahn designed factories using simple architectural forms and fairly plain, functional exteriors. During the same time period, Kahn also designed revival-style buildings with traditional ornament. The officer housing units of the Brick Quarters complex at Wright-Patterson (1934–1935, Figure 15) are based on a Tudor Revival housing design originally drafted by Albert Kahn in the 1920s to be used at the Army's air facility at Langley, Virginia. These houses contain ample traditional details, such as steeply pitched tile roofs, half-timbering, and patterned brickwork. Clearly, Kahn had no problem designing both stripped-down modern factories and traditional Tudor-style housing units with picturesque ornament.

Figure 15. Brick Quarters Officer Housing Unit (built 1935–1936), Wright-Patterson Area A, designed by Albert Kahn and Louis Lott
Photo by Patrick Bennett, Hardlines Design Company, 2008
The design of these duplex officer quarters at Wright-Patterson was based on a design by Albert Kahn for officer housing at Langley Field. The design was revised and simplified by local Dayton architect Louis Lott in 1934 before construction began on these buildings. The traditional Tudor Revival style of the houses demonstrates that while Kahn designed in a highly functional style for hangars, factories, and shop buildings, he was also willing to design single-family houses in more traditional styles. The DoD would continue to commission buildings in traditional architectural styles, especially Colonial Revival, through World War II and in some cases into the late 1940s and early 1950s.

1941–1946: World War II and the Introduction of European Modernism to the U.S. Military

By the last half of the 1930s, Adolf Hitler's rise to power in Europe led many of the great figures of the Bauhaus and European Modernism to flee to North America. Walter Gropius, Marcel Breuer, and Ludwig Mies van der Rohe (Mies) all came to the United States in 1937–1938 and began teaching and practicing architecture. Although the influence of these designers was felt most strongly after World War II, these men did begin to have an impact on American architecture in the late 1930s and early 1940s. By the early 1940s, this trend extended to military design, with Bauhaus-influenced buildings going up at Naval Station Great Lakes, the U.S. Navy's large training center situated in the Chicago metropolitan area.

The activities of Bauhaus architects in the United States in the late 1930s included Mies's development of a very stringent geometrical style of design. This approach, which was eventually known as "Miesian," was expressed in his design for the campus of the Illinois Institute of Technology (IIT) in Chicago. The Miesian approach emphasized cubic geometry, with buildings arranged on a mathematically proportional grid. Some buildings of the IIT campus were completed in the early 1940s before the growing needs of the World War II effort put an end to most non-military-related construction. The cubic form and geometry of Mies's designs for IIT and other projects influenced American designers in the 1940s, although the Miesian influence would reach its peak after the war, in the 1950s (see page 36).

Other Bauhaus designers who had fled Europe, like Gropius and Breuer, designed buildings in the United States during the late 1930s and early 1940s but with an approach that was less formal and rigid than that of Mies. The American buildings of Gropius and Breuer reflected a sense of modern design that emphasized a less geometrical approach with less symmetry of forms, an approach that has been described as more rough and organic in character (Jacobus 1966:28). These designers continued trends they had been developing in Europe during the 1919–1933 heyday of the Bauhaus (Jacobus 1966:29).

After Gropius and Breuer designed several small private houses in the late 1930s, federal government construction of war-worker housing in the early 1940s created an opening for the two men to team together to design a major American project. Direct American involvement in World War II was looking more and more likely by 1940–1941, and with the U.S. military buildup accelerating, a need for war-worker housing arose in many major cities. In 1941, the federal government hired Gropius and Breuer to design the Aluminum City Terrace, a war-worker housing project in New Kensington, Pennsylvania, a suburb of Pittsburgh (DeLony et al. 1994).

This housing project featured buildings with somewhat cubic forms and flat roofs (Figure 16), but unlike the regular and Mies's highly formal, mathematical-grid-based IIT campus, Gropius and Breuer's housing has a more much more informal, irregular design. The apartment buildings are low and horizontal and are arranged in a series of staggered rows with no central focal point. Rather than being situated at right angles on a formal grid, the Aluminum City buildings are oriented at several different diagonal angles and appear at first glance almost randomly scattered. In reality, Gropius and Breuer arranged the buildings to blend in with the hilly terrain of the construction site, to maximize scenic views from the apartments, and to allow each apartment to receive the greatest amount of daily sunlight. Whereas geometry and form were a primary

concern for Mies at IIT, for Gropius and Breuer, factors like natural light and topography determined the shape of the development (DeLony et al. 1994).

Figure 16. Aluminum City Terrace (built 1941), New Kensington, Pennsylvania, designed by Walter Gropius and Marcel Breuer
Photo by Jet Lowe, Historic American Engineering Record, 1991, photograph from 1944

This complex of buildings reflects the concerns of high-style Modernism as reflected by Gropius and Breuer. Buildings are designed and placed on the site mainly to address concerns about viewsheds, ventilation, and maximizing natural light. The visual effect of the buildings is very informal, and the housing units tend to blend in with the surrounding landscape instead of attracting attention.

While Gropius and Breuer were designing Bauhaus-influenced war-worker housing, some American-born architects were influenced by the Bauhaus as they designed buildings for the U.S. military. Bauhaus-influenced design was brought to Naval Station Great Lakes, Illinois, in 1941–1942 with the construction of the Hostess House (Building 42) and again in 1943 with the Squirrel Hollow Housing Complex (Buildings 142 and 143). Both of these projects are similar in some ways to the Aluminum City Terrace and the idea that architecture should be based on the uses of the building and reflect sensitivity to the existing character of the construction site.

The Hostess House (Figure 17) was designed by Gordon Bunshaft, an architect in the New York office of the recently formed, Chicago-based firm of Skidmore, Owings & Merrill (SOM). Bunshaft had studied the works of the Bauhaus in Europe. The Hostess House used technologically advanced materials and construction techniques, featuring glass curtain walls, geometrical forms, exposed structural elements on the interior and exterior of the building,

and a dramatic open interior made possible by the use of glued laminated roof trusses. Bunshaft's use of these roof supports allowed him to create a very open interior space largely devoid of interior structural walls (see Figure 18).

Figure 17. Building 42, Hostess House (built 1941–1942), Naval Station Great Lakes, Illinois, designed by SOM
Photo by Hedrich Blessing, ca. 1942
This photograph shows the front entrance, sheltered by a porch with a massive concrete slab supported by relatively thin, angled steel posts to create a dramatic architectural effect.

However, the building also has a sense of asymmetry and sensitivity to the site that is more similar to the work of Gropius and Breuer than it is to the more formal approach of Mies (Woodward 1970:12). The Hostess House included a broad flat slab front porch supported by thin posts, and a rear curtain wall of the main space that offered a view of a nearby wooded stream bed. The glass of the curtain wall was set at angles, so the form of the wall was sculptural, in contrast to the flat wall surfaces of many Miesian buildings. The rear of the building sat on a concrete base, and the roofline was slightly extended at the back of the building, creating a shallow porch that overlooked the wooded ravine.

The exaggerated forms of the front porch, the angled glass wall, the building's sharply sloping roofline, and the asymmetrical diagonal lines of the exposed interior roof trusses gave the building a sense of movement and expressive form that has been linked to the American work of Gropius and Breuer in the late 1930s and early 1940s (Woodward 1970:11–12) and the Bauhaus. The building was also clearly designed to take maximum advantage of the scenic

view offered by the wooded ravine. The Hostess House, although heavily altered over the years, still stands at Naval Station Great Lakes.

Figure 18. Building 42, Hostess House (built 1941–1942), Naval Station Great Lakes, Illinois, designed by SOM, interior view
Photo by Hedrich Blessing, ca. 1942
This photograph shows the building's open interior space and the glued laminated wood beams that were used in lieu of structural steel to bridge the wide span needed to achieve such an open interior.

A second Modernist project with affinities to the Bauhaus was undertaken by the Navy at Great Lakes in 1943, the so-called Squirrel Hollow officer housing complex (Great Lakes Buildings 142 and 143), designed by the Chicago firm of Elting, Lamb & Schweikher. Architect Paul Schweikher, a principal of the firm, was a noted avant-garde designer of the 1930s and 1940s who later went on to become chairman of the Yale School of Architecture.

Squirrel Hollow is a series of apartments for officers built on the edge of a wooded ravine with a creek at the bottom. The buildings consist of two long, horizontal multi-apartment buildings with flat roofs. The interiors feature open floor plans and simple, plain woodwork, omitting the usual trim and moldings seen in many houses and apartment buildings of the time. The fronts of the buildings are cubic, emphasizing privacy through the use of small punched-in windows and brick walls. The rear of the building, however, like the Hostess House, faces a wooded ravine. The rear walls of the buildings originally featured large

expanses of glass and deep recessed porches, creating a unity between interior and exterior spaces. Some of the open spaces on the rear walls of the buildings were later filled in to provide more living space.

Both of the two buildings were tilted at an irregular angle, presumably to maximize views of the ravine and enhance the flow of sunlight into the buildings, a feature similar to the houses at Gropius and Breuer's Aluminum City Terrace. Squirrel Hollow shows a concern with setting and topography similar to what is seen at Aluminum City Terrace, and at Bunshaft's Hostess House.

In contrast, some other early 1940s buildings at Naval Station Great Lakes and other military installations were more traditional in style. The so-called Fishbowl housing complex at Great Lakes (1942, now demolished), for example, was a conventional U-shaped housing development with brick walls and white Colonial Revival wood trim. Other wartime buildings at Great Lakes were constructed in a gabled wood-frame mode that was based on standard plans for World War II temporary mobilization construction. These simple wood-frame buildings were constructed with mass-production methods but in many cases featured rooflines and multi-pane double-hung windows that reflected the influence of the highly traditional Colonial Revival style.

Some World War II temporary mobilization buildings at Naval Station Great Lakes would not qualify as high-style examples of Modernism, but they were designed in a plain, functional mode that did not use traditional Neoclassical Revival or Colonial Revival details. Particularly important were the station's massive drill halls, which were designed in a functional mode with no architectural ornament at all. The drill halls featured glued laminated timbers to span large distances so the drill hall interiors could be built without support columns. The design allowed these buildings to serve as large indoor parade grounds. Laminated timber arches also allowed the Navy to avoid using structural steel, a precious material that was needed to build tanks, ships, and weapons needed in the war. Although designed to last only for the duration of the war, some of these drill halls continued to be used by the Navy up into the 1990s; all of these drill halls were demolished during the last twenty years as the Navy modernized its training facilities.

The mass-production techniques used to build the drill halls and other temporary mobilization structures during the war quickly and cheaply were very influential in the postwar era, as prefabrication made its way into private-sector construction. Quonset Huts and wood-frame World War II temporary buildings taught the military much about mass production, standardization, and using prefabricated standardized materials, all of which would be useful after the war for the mass-production of standard buildings like tract housing and apartment buildings.

At Wright-Patterson, the World War II era saw some influence on building design, although the buildings do not tend to have the high-style Bauhaus characteristics of the Hostess House and Squirrel Hollow at Great Lakes. Wright-Patterson includes several examples of buildings with flat rooflines and cubic exteriors. The inclusion of ribbon windows in these buildings may show some influence of the Art Moderne style, but note that these buildings are generally cubic in form and do not include the dramatic curved, streamlined features associated with pure, high-style Art Moderne buildings. The buildings seem to be fairly conservative reflections of the formal Modernism associated with the Bauhaus, but with some lingering Art Moderne influence.

Wright-Patterson has several examples of this somewhat conservative style reflecting a toned-down cubic Modernism with perhaps some residual influence of Art Moderne use of glass block and long stretches of ribbon windows. The best example is Building 20028, the Wright Field Aircraft Radio Laboratory, built in 1942 (Figure 19). The low, horizontal, flat-roofed form of this building is Modernist in form. The building has almost no applied ornament and features horizontal bands of window openings, with the openings filled in with a combination of glass block and industrial windows. The overall effect gives the building a stark, plain, cubic appearance, with strong horizontal lines. The building represents a conservative version of Modernism, however, as it does not contain many of the more distinctive features, such as cantilevered construction, use of glass curtain walls, or integration of interior and exterior space. The use of long horizontal registers of ribbon windows on the building likely reflects a slight lingering influence of the Art Moderne style.

Another set of Modernist-influenced buildings at Wright-Patterson is the Aeromedical Lab complex of 1942 (Building 20029, Figure 20), designed by the Wright Field Office of the U.S. Army Corps of Engineers. This building is a four-story concrete box with plain walls and a series of horizontal windows. The windows on the second and third floors are separated by brick veneer. The brick fill between the windows links the series of windows into a horizontal band, giving it something of the horizontal look of a ribbon window. The use of ribbon windows, the plain cubic form of the building, and the lack of Art Deco stepped massing or Art Moderne curves or streamlining, suggests that the building has been influenced by the Bauhaus. However, as a boxlike building with relatively small window openings and no cantilevered construction, the building is also a fairly conservative example of architectural Modernism.

An examination of Naval Station Great Lakes and Wright-Patterson shows that European Modernist-influenced design was being used for military buildings in the Midwest in the early years of the 1940s, but high-style Modernism was also being used in the western United States and Hawaii. Several Naval and Marine Corps bases in Hawaii and Southern California had new buildings designed in a Modernist idiom that went beyond the streamlining tendencies of the Art Deco and Art Moderne.

Figure 19. Building 20028, Aircraft Radio Laboratory (built 1942) at Wright-Patterson Area B
Photo by Roy Hampton, Hardlines Design Company, 2011
The building has a flat roof and is composed of rectilinear forms. The strong horizontal ribbon windows with a mix of steel sash windows and glass block are very characteristic of 1940s Modernism but also show some lingering influence of Art Moderne.

Figure 20. Building 20029, Aeromedical Laboratory (built 1942), Wright-Patterson Area B, designed by the U.S. Army Corps of Engineers
Photo by Mike Krakovsky, Hardlines Design Company, 2008
The building has the overall cubic form associated with Modernism, and although the windows are punched-in individual units, their horizontal proportions and the contrasting brick bands that divide the windows create an effect that is similar to that of a ribbon window. The windows on this building have been replaced, and the barrel-vaulted structure on the roof is a later addition.

One example of this trend was the construction of officer housing and Navy crew recreational facilities at Roosevelt Naval Base in Southern California. The buildings were designed by California architects Paul Revere Williams and Adrian Wilson, working as a partnership known as Allied Engineers. Wilson was recognized as a California Modernist designer, and the buildings had a sense of cubic form (see Figure 21) and fairly unornamented interior spaces that are reminiscent of European Modernism and the Bauhaus. The buildings feature ribbon windows and entrances framed by cubic porches or concrete slab porches mounted on thin posts. Many of the buildings with Modernist features were built to provide administrative space and recreational facilities for ships' crews. Much of the rest of the base was devoted to warehouses and ship-repair facilities (The Paul Revere Williams Project 2011).

Figure 21. Administration Building (built 1941–1943), Roosevelt Naval Base, California, designed by Allied Engineers
Photo by Rob Tucher, Historic American Buildings Survey, 1991
The bold geometrical forms of the Administration Building reflect the influence of high-style European Modernism.

Another Naval building that illustrates a somewhat advanced understanding of Modernism was the Aiea Naval Hospital in Hawaii (Figure 22), designed in 1942 by architect Charles W. Dickey under the supervision of the Bureau of Yards and Docks (U.S. Marine Corps 2009:37). As originally built, the building had a windowed center block, with two side wings composed of a series of concrete balconies that gave these wings continuous horizontal lines. The overall stack-like effect of the horizontal balconies goes beyond the streamlining of the Art Moderne style and suggests that Dickey's design may have been influenced by Bauhaus architecture. Some of Dickey's buildings of the late 1930s show strong Art Deco and Art

Moderne influence, but he also incorporated traditional Hawaiian architectural forms into his work and is credited with developing a distinctively Hawaiian approach to design. Dickey's design for the Aiea Naval Hospital is more abstract and stripped down than his Art Moderne-influenced work of the 1930s. Dickey died later in 1942 after designing the hospital, so it is reputed to be the last project he designed. The building still stands and is now part of Marine Corps Base Hawaii.

Figure 22. Aiea Naval Hospital (built 1942), Hawaii, designed by Charles W. Dickey
Photo by the *Honolulu Star-Bulletin*, 27 October 1944, provided by the University of Hawaii Library

1947–1954: Postwar Modernism in Military Architecture

While 1946 was a year of demobilization and winding down the World War II effort, 1947 is widely accepted as the beginning year of the Cold War. The more abstract forms of Bauhaus design and European Modernism in general became more acceptable in the Cold War years, and they had the added advantage of being less expensive and quicker to build since they did not require the trim and sculpted architectural details typically used for traditional buildings. Architectural references to Classical design were important propaganda tools before World War II, but after the war, they seemed more dated and less necessary (Frampton 1980:222). In addition, they carried negative associations since Hitler and Mussolini had used simplified Classical design.

The promotion of architectural Modernism in American architecture schools was well underway by 1947 via former Bauhaus leaders Mies, Gropius, and Breuer, plus other European Modernists who had fled Hitler and World War II and decided to remain in the United States. Other European Modernist designers like Sweden's Alvar Aalto chose to remain in their native countries but did extended stays in the United States, helping to spread Modernist influence.

In addition to marking the beginning year of the Cold War, 1947 was also the year that the United States Air Force was established as a separate armed forces branch; previously, it had been part of the U.S. Army. As a new branch, the Air Force had a particularly high need for new facilities at the end of the 1940s and during the early 1950s. A fairly large amount of construction went on across the DoD during the early 1950s, as old World War II temporary buildings were replaced with modern buildings, and new facilities were built to accommodate new technologies. Although in the case of both the Army and the Navy, older permanent buildings were often re-used for new purposes, making new construction unnecessary in some cases.

In the case of the Air Force, some older Army Air Forces facilities, such as Wright-Patterson, became Air Force bases in 1947, and existing buildings were extensively re-used. However, some Air Force installations, such as Offut Air Force Base in Nebraska, were built largely from scratch to accommodate the new needs of the Air Force. Planning work also began in the first half of the 1950s for a new service academy for the Air Force, as the Air Force did not have the equivalent of the U.S. Army's West Point or the Naval Academy at Annapolis. The planning, design, and the beginnings of construction of the Air Force Academy was probably the most important set of events in DoD Modernist architecture during the 1950s and early 1960s.

One cannot discuss the design of military bases and their buildings during the late 1940s and 1950s without reviewing the influence of the site planning concepts of German-born architect Ludwig Mies van der Rohe (Mies), who fled Germany around 1937 and subsequently taught and practiced architecture in the United States. The influence of Mies on the planning of American campuses and other complexes of building can be traced back to his 1938 campus design for the Illinois Institute of Technology (IIT) in Chicago (see page 28). The IIT campus design and the associated buildings that were completed in the 1940s (the campus was a long-term phased construction project) had some influence on pre-World War II and wartime American architecture, but the influence of these buildings exploded into a widespread architectural movement after World War II. The symmetry, massiveness, and cubic glass box design of the IIT campus, and other projects that Mies designed in the 1940s and 1950s, would have a tremendous influence on 1950s American architects. It is necessary to back up and take a closer look at Mies's work at IIT in the World War II and pre-war years (ca. 1938–1945) in order to understand its impact on military base planning in the late 1940s and 1950s.

The Miesian design approach of the 1930s and 1940s was one of monumental buildings showing highly regular, cubic forms, large expanses of grid-like glass and metal walls, and exposed concrete and steel support elements. Mies saw this type of design as representing logic, reason, and science, and he felt that the use of modern metal and glass and the regular geometry of the buildings was linked to the advance of technology and an aesthetic based on modern mass-production. Mies placed a high value on technology and felt that it was the main concept that defined modern humanity (Frampton 1992:231–233).

One of the early influential American projects by Mies, both in terms of building design and campus planning, was the 1938 design for the IIT campus. The buildings, as planned, had cubic exteriors with extensive glass, and were all of an identical four-story height. The plan was highly regular and symmetrical (Figure 23), with the buildings grouped closely together (Figure 24) and a large lawn divided by a road at the center of the campus. Several of the planned

buildings were low and massive in scale, but included multiple interior courtyards that allowed natural light into the vast interior spaces of these buildings. The whole campus was laid out using a geometrical grid composed of squares that measured 24 feet by 24 feet (Frampton 1992:231–233). Building interiors were in many cases composed of large open spaces so the building could be easily reconfigured for multiple uses as technologies changed (see Figure 25).

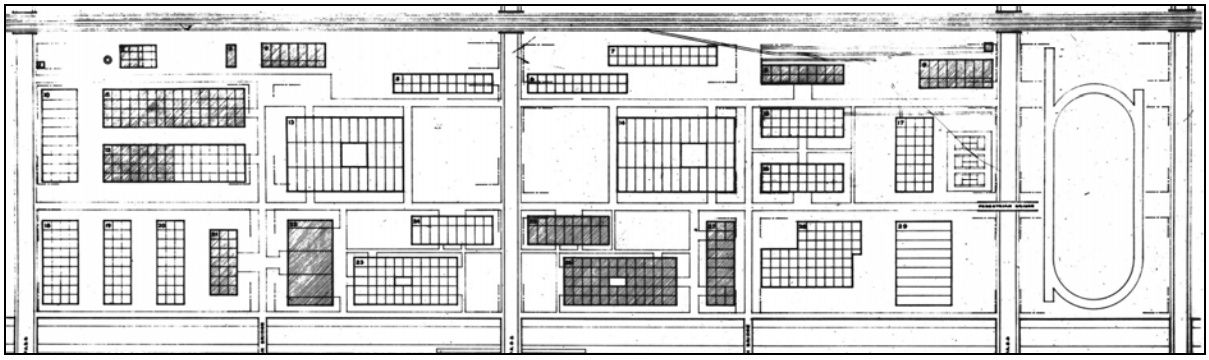

Figure 23. Campus plan for the Illinois Institute of Technology, 1938, Chicago, designed by Mies van der Rohe
Drawing by Ludwig Mies van der Rohe, provided by Illinois Institute of Technology

The arrangement of buildings in this campus layout is nearly symmetrical. Buildings are spaced evenly and placed at right angles, in a very regular geometrical pattern that Mies would have associated with the ideas of logic, science, and rational thought. Contrast with (page 41), which is a highly asymmetrical campus layout by Walter Gropius and his associates, showing a more informal approach based more on the convenience of building location, ventilation, and penetration of natural light into the buildings.

One characteristic of the Miesian movement that its proponents saw as an advantage was the idea that because the style was clear and simple and did not require esoteric knowledge of the architecture of the past, it was therefore easy to understand and replicate. Promoters of Miesian design claimed that its simplicity allowed it to be mastered by architects of any skill level; design in the Miesian mode did not require a great deal of creativity or talent, so it was thought that the Miesian approach allowed less-skilled architects to produce good designs (Adakov et al. 2010:134).

Site planning was important for military architecture of this period, and some complexes of military buildings were heavily influenced by the Miesian approach to site planning. Other military building complexes followed a different approach that appears to reflect the influence of designers like Walter Gropius, Eero Saarinen, and others, and this design approach, which differed from the Miesian approach is discussed on pages 40–41. Some new installations were built from scratch, especially by the Air Force since it was a new service branch. Laboratory or office campuses were also developed by the DoD on empty land at existing military bases, or complexes of old World War II buildings were demolished in favor of construction of new training, research, or administrative campuses. Site designs for these complexes tended to be influenced by campus planning work that had been done by significant Modernist architects in the 1940s and early 1950s, including Mies.

Figure 24. Metallurgy and Chemical Engineering Building (built 1942–1946), Illinois Institute of Technology, Chicago, designed by Mies van der Rohe
Photo by Bill Engdahl, Hedrich-Blessing, ca. 1946
The exterior form of the buildings is highly cubic and composed of a concrete frame that reflects the form of the interior structural steel frame, plus large infill areas of glass and brick.

The popularity and accessibility of the Miesian style led to a whole generation of glass box towers—buildings with a steel or reinforced-concrete structural frame and glass and metal curtain walls on the outside. At first, these buildings seemed original and almost futuristic, but by the 1970s, the form had been repeated so often that it began to fall out of favor. The first American glass box skyscraper with flat, smooth, metal-and-glass exterior walls was the Equitable Savings and Loan Association Building in Portland Oregon, designed in 1944 by Pietro Belluschi. Construction work on this facility was not completed until 1948, after the war's end, when metals were no longer needed for wartime (Roth 2001:414). Important examples of the glass box tower were designed by SOM and by Mies himself during the 1950s. Gordon Bunshaft's Lever House (1950), a high-rise glass-and-steel tower in New York City, is often cited as one of the more creative and aesthetically successful of the early glass boxes. Mies's Seagram Corporation Headquarters tower of 1958, also in New York, was also considered to be a masterpiece of the glass box approach. Since the DoD was not involved in commercial architecture in large cities, it did not build large numbers of tall glass box towers, although some high-rise hospital buildings such as the former U.S. Naval Hospital at Naval Station Great Lakes, were built by the DoD in the 1950s.

Figure 25. Crown Hall (built 1950–1956), Illinois Institute of Technology, Chicago, designed by Mies van der Rohe, interior view
Photo by Hedrich Blessing, ca. 1956
Many of the IIT buildings had open interiors so that the building could be used in a flexible manner for a variety of functions.

Firms like SOM and Pace Associates were strongly influenced by the Miesian approach, and they completed extensive design work for the DoD during the 1950s and early 1960s. SOM was the leading architectural firm for high-profile military work in the 1950s, winning contracts for the Naval Postgraduate School in Monterey, California (1952–1954), and the prestigious Air Force Academy Campus (1956–1962) in Colorado Springs.

Although the influence of the Miesian design approach can be detected in the 1950s military building designs of SOM and others, it is important to remember that this was not the only Modernist influence. The designers at SOM and other firms were well aware of the European design work of Modernist masters like Le Corbusier. Several prominent campus projects were designed in the United States during the late 1940s and early 1950s by prominent Modernist designers like Eero Saarinen and by a firm known as The Architects Collaborative, founded by Walter Gropius. The design approach favored on these campuses was less formal and offered something of an alternative to the more formal grid-based approach seen in the 1938 IIT plan by Mies. The buildings often had rectilinear lines and skeletal construction with glass curtain walls, and so they do have some features in common with Miesian design, but they also tended to be long and narrow in shape to take advantage of natural light, and were often arranged together in fairly tight, asymmetrical compositions, with lawn space between them to

provide green space and ensure that natural light was available for each building. The buildings were often placed parallel to each other in a staggered pattern, or were arranged in a zig-zag form where the buildings were connected to each other on their narrow ends.

The site plan of the 1949–1950 Harvard Graduate Center by The Architects Collective is a good example of this type of site design. Other influential campus designs were Saarinen, Swanson & Saarinen's 1947 design for the Science and Pharmacy Laboratories at Drake University in Des Moines, Iowa; and Eero Saarinen's 1949–1950 General Motors Technology Campus in Warren, Michigan. Renderings and site plans of these campuses were published in widely available journals like the *Architectural Record* and had a widespread influence on architects and site planners of the 1950s and 1960s (Weitze 2003:237–240). Sometimes the more informal approach was embraced fully for a specific campus design, or at other times, designers used elements of the more formal, symmetrical Miesian planning and the less formal approach of designers like Gropius and Saarinen.

One of the early examples of 1950s military Modernism was the Naval Postgraduate School, designed by SOM in 1952. The building was a complex of eight structures housing nine different academic departments (see Figure 26).

Figure 26. Naval Postgraduate School (built 1952–1954), Monterey, California, designed by SOM, aerial view
Photo by Morley Baer, 1954

This photograph shows the General Classroom and Office Building at the center and how the other buildings of the complex are grouped around it. The General Classroom and Office Building is a series of concrete slabs with glass sandwiched in between, and is somewhat reminiscent of several designs by Le Corbusier. The layout arranges the buildings in an asymmetrical pattern, with smaller buildings grouped around the General Classroom and Office Building, with lawn space in between to provide open space and to allow natural light inside the buildings.

The complex included the large multi-story General Classroom and Office Building, along with the shorter buildings of the two-building Electrical, Mechanical, and Aeronautical Engineering Complex, the Auditorium, and the Cafeteria. The General Classroom and Office Building sits on one end of the complex, while most of the other buildings are oriented around a landscaped plaza with trees and grass. With its series of long, low buildings arranged in an asymmetrical composition on a campus landscaped with trees, grass, and walkways, the campus more strongly reflects the informal approach to campus design than the formalism of Mies's IIT campus plan.

The Naval Postgraduate School's General Classroom and Office Building is a multi-story facility composed of a series of concrete slabs supported by concrete posts, with glass in between the posts (see Figure 27). The overhanging concrete slabs give this building a tiered appearance that contrasts with the rest of the campus, in which the buildings are more box-like. The stacking of the overhanging concrete slabs on the General Classroom and Office Building is more reminiscent of early Le Corbusier or other Bauhaus or European Modernist designers than it is of Mies.

Figure 27. General Classroom and Office Building (built 1952–1954), Naval Postgraduate School, Monterey, California, designed by SOM
Photo by Morley Baer, 1954
This more close-up view of the General Classroom and Office Building (at left in photograph) gives a clear view of the stacked reinforced-concrete slabs that are supported on thin reinforced-concrete posts. The spaces between the posts are filled in with glass, and the overhang of each concrete slabs gives the building a consistent pattern of light and shadow, as well as strong horizontal lines. A covered walkway connects the General Classroom and Office Building with the smaller building at right in the photograph. Note the difference between this building and the 1942 Wright-Patterson Aeromedical Building depicted in Figure 20 (page 34), which has solid-looking walls punctuated with a series of windows. In the photograph above, the building no longer has solid exterior walls and is a framework of concrete slabs and posts, with the open spaces between filled in with glass. This visual approach emphasizes the building's structural frame and gives the building the appearance of lightness.

The other shorter buildings of the campus include the Electrical Engineering and Aeronautical Engineering Departments, the Auditorium, and the Cafeteria (Danz et al. 1963:49). The Auditorium is a low one-story building surrounded by a porch supported on square posts. The Naval Postgraduate School's Mechanical and Aeronautical Engineering Building, Electrical Engineering Building, and the General Classroom and Office Building, are more cubic in form. On the exterior of each of these three buildings, the grid of concrete structural posts and beams frames a series of rectangular openings filled in with glass and in some cases wood panels. The visual vocabulary used for these buildings is similar to the 1942–1946 laboratory and classroom buildings by Mies at the IIT campus in Chicago, and the long, thin rectilinear form of many of the buildings is similar to the forms preferred by Gropius and Saarinen in their late 1940s campus designs for projects such as the 1949–1955 General Motors Technical Center and the 1949–1950 Harvard Graduate Center. Like many SOM projects of the 1950s, the Naval Postgraduate School shows the influence of Mies but also of other Modernist designers like Le Corbusier, Gropius, and Saarinen.

Miesian influence can be seen in several individual buildings designed for existing military installations in the first half of the 1950s, especially SOM-designed buildings constructed at Naval Station Great Lakes between 1952 and 1954. Since Great Lakes was a training installation, many of the concepts of planning and design from the IIT campus and other higher-education projects of Mies and other Modernists could be easily applied. A large area of land north of the original 1906–1911 Great Lakes campus was occupied during World War II by parade grounds and wood-frame temporary buildings, but it was developed into what was known through the 1990s as the Service Schools Area, a campus for advanced specialty training for enlisted men. The Service Schools area had a grid-based layout with rectilinear streets, with buildings developed piecemeal from the early 1950s through the 1980s and designed by several architectural firms.

The initial Miesian-influenced SOM design at Great Lakes in the Service Schools area was the 1952–1954 Gunners' Mate School (Building 521), a massive cubic glass box on a grass lawn (Figure 28). This simple, massive building was designed by SOM in the early 1950s. The exterior was composed of a highly regular metal grid of thin elements that were fitted with small green glass panels. The result was a restrained, uniform geometrical effect that amplified the building's large size. The exterior was plain, but the massiveness and repetition of the stark cubic exterior gave the building a sense of monumental scale. The unbroken boxlike geometry of the building is more strongly Miesian than many of SOM's other designs of the 1950s. This building was demolished in 2010.

Figure 28. Building 521 (built 1952–1954, demolished 2010), Naval Station Great Lakes, Illinois, designed by SOM
Photo by Hedrich Blessing, 1954

This photograph shows the massive boxlike glass exterior of the building as originally constructed. This building is one of the more strongly Miesian of SOM's military building designs of the 1950s.

SOM's second project at the Great Lakes Service Schools area was also very Miesian in character. The Fire Control Technician, Instrumentman, and Opticalman Service School facilities (Buildings 616 and 617) were built at Great Lakes in 1954. These buildings were also cubic, and the exteriors of both buildings were grids made up of reinforced-concrete beams and posts, with the rectangular wall spaces inside the grid filled in with glass and, in some places, buff-colored brick (see Figure 29). These buildings also convey a sense of cubic monumentality that is similar in some ways to the Gunners' Mate School but with more use of concrete and brick on the exterior rather than glass and metal. Buildings 616 and 617 are also similar in overall form to Mies's Metallurgy and Chemical Engineering Buildings (1942–1946; Figure 24, page 39) at IIT. In addition to the exterior vocabulary, Buildings 616 and 617 present massive cubic exteriors while the insides of each building contain large courtyards: one courtyard for the smaller Building 616 and two for the larger Building 617. The original interiors contained large, open laboratory and classroom spaces that could have been used flexibly for different uses (see Figure 30). The use of massive rectangular buildings with one or two large courtyards is another feature that appears on Mies's 1939 IIT plan. Although they have been extensively altered by multiple interior remodeling episodes and a 1993 exterior window and door replacement, Buildings 616 and 617 are still standing at Great Lakes.

Figure 29. Building 616 (built 1954), Naval Station Great Lakes, Illinois, designed by SOM
Photo by Bill Hedrich/Hedrich Blessing, 1954

This Great Lakes building by SOM also has a fairly strong Miesian character. The building is similar in exterior design to several of the Mies laboratory and classroom buildings at IIT, built from 1942–1946 (compare with Figure 24, page 39). Building 616 also has a massive box-like exterior appearance, but courtyards are included in the center to allow light into the massive building without breaking up the simple exterior massing. The structural frame of the building is also represented by a concrete grid on the exterior, while a combination of glass and buff-colored brick were used to fill in the spaces that are framed by the concrete grid.

Figure 30. Building 616 (built 1954), Naval Station Great Lakes, Illinois, designed by SOM, interior laboratory space
Photo by Hube Henry/Hedrich Blessing, 1954

Many of the interior rooms were large, fairly open spaces that could be reconfigured easily to fit different functions. Numerous windows and the two courtyards provided ample natural light in the classroom and laboratory spaces and in corridors. The character of this classroom space is simple and plain, with acoustical tile ceilings, fluorescent lighting fixtures mounted in the ceiling, and synthetic tile floors. Similar use of fairly open flexible spaces that could be reconfigured for different uses was a mark of Mies's work at IIT during the 1940s and early 1950s.

Many of the same sources that influenced SOM's Navy Postgraduate School and other Navy work also influenced campus and building designs for other Military Services. For example, in the late 1940s and early 1950s, Air Force Materiel Command (AFMC) began planning a new research center for Hanscomb Air Force Base, Massachusetts. The final research center design, developed ca. 1954 by Coolidge, Shepley, Bulfinch & Abbott, was composed of a central group of long, narrow three-story buildings with a one-story building in between, with the group of buildings arranged in a somewhat staggered pattern (Weitze 2003:237).

The design was heavily influenced by 1951 Air Force recommendations that the center be modeled on campus plans by eminent Modernists. One of the Air Force's recommended sources was the Harvard Graduate Center, a 1950 design by The Architects Collaborative, a firm composed of Modernist designer Walter Gropius and seven other architects. The Air Force also recommended Saarinen's General Motors Technical Research Center as a suitable model (Weitze 2003:237–240).

Other eminent Modernist architects completed major projects at other military installations during this time period and are worth mentioning. Richard Neutra, known for his highly distinctive designs for housing in California during the 1920s and 1930s, partnered with architect Robert Alexander in the postwar years to establish the Neutra & Alexander firm. Neutra & Alexander won a commission in 1953 to design military housing under the Wherry Act at Mountain Home Air Force Base in Idaho. The housing, built in 1954, was low, horizontal, and flat roofed, featuring fairly open floor plans, private garages, and concrete patios. Neutra & Alexander were assisted in construction administration for the project by the architectural firm Hummel, Hummel & Jones of Boisie, Idaho (Erickson et al. 2010:7–12).

1954–1963: Later Modernism and the U.S. Air Force Academy

The influence of the Bauhaus, European Modernism, and the Miesian movement continued through the late 1950s and into the 1960s, but other architects also began to influence American military design later in the 1950s. Architect Louis Kahn was a strong influence in the last half of the 1950s, and he took a somewhat different approach to design than Mies. Whereas Mies wanted to expose the structure on the exterior of the building, Kahn used brick to obscure the structural elements on the exterior. Philip Johnson also hid the structural frame on the exterior of buildings, but he used glass instead of brick. Both designers created buildings with Miesian features but with emphasis on elements other than the exposed. Louis Kahn's 1954 Yale Art Gallery was a particularly influential building (Frampton 1992:242–243).

The most important DoD project from this era was the United States Air Force Academy in Colorado Springs, a project designed by SOM. The lead architect on the project was a relatively young designer, Walter Netsch, who worked under the supervision of the older and more experienced Gordon Bunshaft. The academy campus was designed in 1954 and constructed from 1956–1962 (Jacobus 1966:110–111). The public is most familiar with the Air Force Academy Chapel, a tall building with sharp triangular forms and large expanses of glass (Figure 31, and Figure 47 [interior], page 67). This building reflects the forms of modern jet aircraft while at the same time picking up on the vertical forms of the mountain landscape around the academy's site. The remainder of the central portion of the campus, known as the Cadet Area, is laid out on a grid plan, but the plan has an irregular, almost zig-zag shape to fit the site's topography and make access convenient for the cadets when they move from the dormitories to the classroom and recreational buildings (see Figure 32, page 50). The site was built up into a series of terraces to accommodate the Cadet Area buildings and the central plaza.

Aside from the Chapel, the Cadet Area buildings are, for the most part, rectilinear in form. The form of some of the buildings, especially the plan of the cadet barracks with large interior courtyards, seems to in some ways reflect Mies's IIT plan and buildings. However, Air Force planners most likely considered Mies's IIT campus to be too factory-like and not sufficiently monumental to serve as the primary model for the Air Force Academy. Few completely Modernist university campuses other than IIT existed in the United States in 1954, so several Air Force planners visited the University of Mexico campus in Mexico City. The University of Mexico was designed in a Modernistic style, but the building forms varied more and included artwork such as large murals (Brugemann 1994:87).

Figure 31. View of the U.S. Air Force Academy, Colorado, showing the Chapel (built 1956–1962), designed by SOM
Photo by Skidmore, Owings & Merrill, ca. 2005

This view shows both the regular cubic geometry of the barracks, administrative buildings, and plaza of the Cadet Area, contrasting with the expressively sharp vertical triangular forms of the Chapel. The administrative and barracks buildings can be seen in the background, and a portion of the Terrazzo, the main plaza, can be seen in the foreground, marked off with a linear grid of light-colored pavement. Although it was undoubtedly influenced by Mies and Eero Saarinen, and perhaps other eminent Modernist designers of the time, the Cadet Area is a highly original design that responds to the character of the mountainous site. The design of the Cadet Area also reflects the idea of the Air Force Academy as a monumental campus that serves as a Modernist architectural equivalent to the U.S. Army's academy at West Point, and the U.S. Naval Academy at Annapolis.

Several designers, including Eero Saarinen and Walter Gropius, tended in the late 1940s and early 1950s to create informal campus layouts composed of a series of long, narrow buildings with landscaped spaces in between. Good examples of this trend are the 1949–1950 Harvard Graduate Center by The Architects Collaborative (a firm founded by Gropius) and the Science and Pharmacy Laboratories at Drake University in Iowa, by Saarinen, Swanson & Saarinen.

In the case of the Air Force Academy, the campus of the General Motors Technical Center in Warren, Michigan, built from 1949–1955 and designed by Eero Saarinen, had a significant influence on the layout of the Cadet Area. In the design of the Warren Plant, Saarinen was influenced by Mies but also by Le Corbusier and other European Modernists (Brugemann 1994:87–89). Many of the buildings were glass walled and had a rectilinear shape, with the first floor supported on thin supports (pilotis), but other features of the campus more informal and less in the spirit of Miesian design. Similarly, the U.S. Air Force Academy Cadet Area buildings and campus layout are a fusion of several influences, in response to the unique

characteristics of the construction site, and include Mies; the informal Modernist campus plans of the late 1940s and early 1950s by Gropius, Saarinen, and others; and creative innovations on the part of the SOM design team and landscape designer Dan Kiley.

The heart of the campus as designed by SOM was the Cadet Area, a group of buildings centered on a plaza that was known as the Terrazzo. The original group of Cadet Area buildings included Vandenburg Hall (a large dormitory on the north side of the Terrazzo), Fairchild Hall (the main academic building on the plaza's east side), Mitchell Hall (the cadet dining facility on the plaza's south side), and on the west side of the plaza, the Chapel, the Arnold Hall recreational center, and the Harmon Hall administrative building. The south side of the Terrazzo west of Mitchell Hall was originally open and landscaped with trees, but in the late 1960s, this open space was filled in with Sijan Hall, a new dormitory building. Several other additions and new buildings have been built in the Cadet Area since the 1970s, but the area retains much of its original character and layout today.

The Cadet Area's largest building is the four-story Vandenburg Hall (see Figure 33 and Figure 35), which extends the entire length of the Terrazzo and has a significant amount of glass on the exterior. Vandenburg has four interior courtyards, and the larger west section of the building is connected to the smaller east portion by a low connector wing that serves to break up the building's mass. The low, massive rectilinear form of the building and the use of interior courtyards is somewhat reminiscent of the Mies IIT plan of 1939.

However, Vandenburg Hall is far from being a simple Miesian box. SOM used the site topography and cantilevered construction techniques to give the building some sophisticated visual effects. The building is integrated into the hilly site in a way that makes it look like two boxlike buildings from the terrazzo level, while from a lower elevation it appears to be one interconnected building. Vandenburg Hall also has a horizontal recess that goes through the entire center of the building, splitting up the building's boxlike forms and giving something of an illusion that the top two floors are floating.

Fairchild Hall (Figure 34) is the academic building and one of the largest buildings of the Cadet Area. This building also has a large quantity of glass, is composed of large boxlike massings, and had an interior courtyard when the building was originally constructed. In its original form, the north library portion of the building appeared to be a separate building from the south portion of the building when viewed from the terrazzo level, a splitting up of the building's mass that is similar to what was done at Vandenberg Hall.

Mitchell Hall (Figure 36), the cadet dining hall, is a much smaller, nearly square building, with a porch that wraps around all four sides. The building's square form contrasts somewhat with the rectangular boxes that make up the massing of Vandenburg and Fairchild Halls.

Arnold Hall, the recreation building, contains an auditorium. Due to the needs of the auditorium, the building does not feature the extensive use of glass seen in the Vandenburg and Fairchild Halls and instead is clad on the exterior with a smooth stone veneer. Harmon Hall, the administrative building, is long and narrow, and features a recessed first floor with pilotis, giving the upper floors a floating appearance. The exterior of Harmon Hall features an abundance of glass and is more similar to Vandenburg and Fairchild Halls than to Arnold.

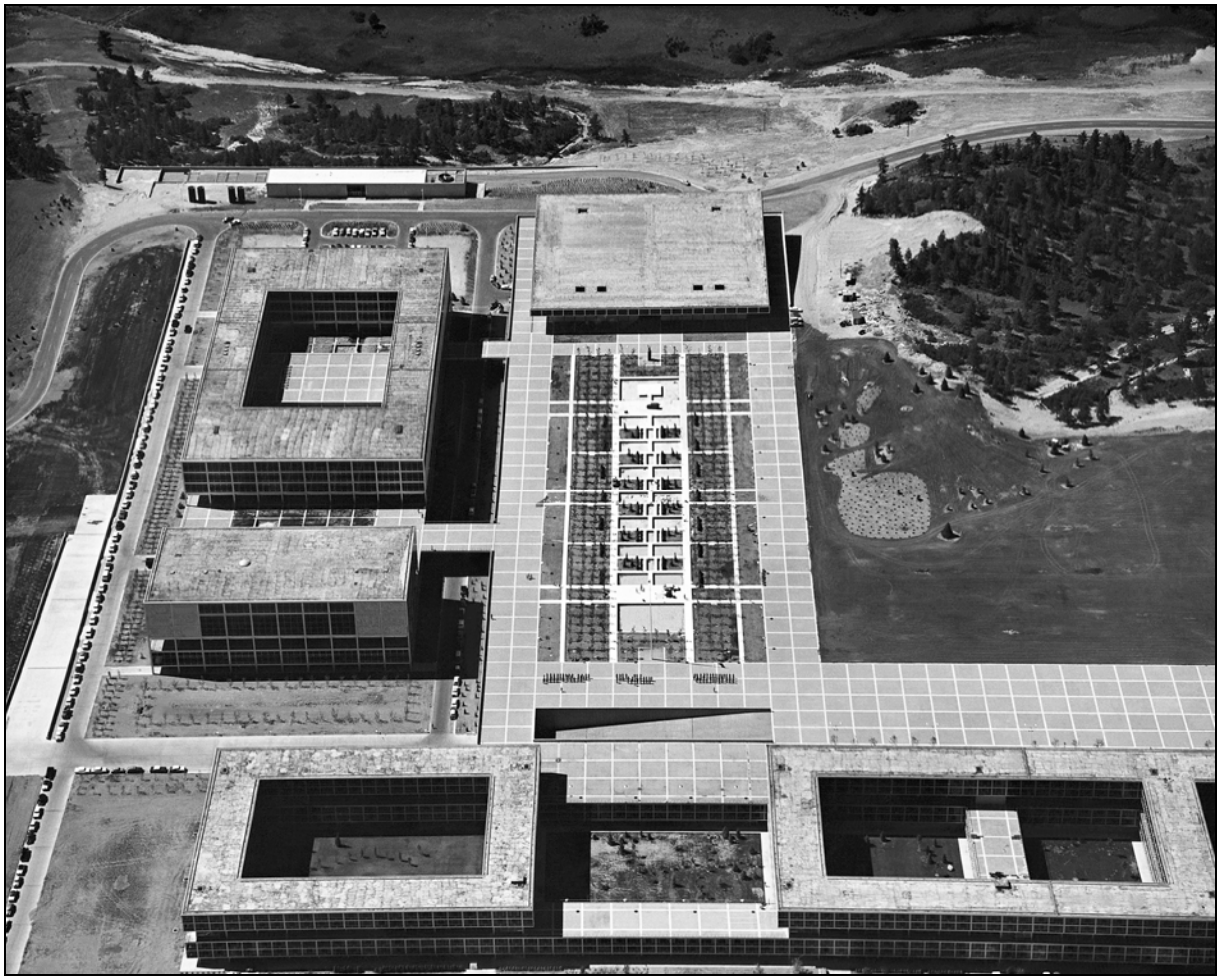

Figure 32. West portion of Cadet Area (built 1956–1962), U.S. Air Force Academy, Colorado, designed by SOM, aerial view
Photo by Stewarts Commercial Photographers, ca. 1963

(North is toward the bottom of the photograph.) Vandenberg Hall is visible at the bottom of the photo; Fairchild Hall is visible to the left. Also visible are the Terrazzo at the center of the photograph, and Mitchell Hall at the center top. The upper right portion of the photo showing a hillside landscaped with trees is now the site of Sijan Hall, which was added later to provide more dormitory space. The layout has some similarities with Mies's IIT campus, including use of a grid and dimensional modules, placement of buildings at right angles to each other, and extensive use of interior courtyards to give the exterior shells of the buildings the appearance of being very large boxes. Other aspects of the composition seem to be more closely related to Saarinen's campus for General Motors in Warren, Michigan. The layout was carefully designed by SOM to fit the construction site, and to ensure that cadet dormitories were close to facilities like mess halls, classrooms, and laboratories. The layout seeks to create a practical and efficient design while also providing a monumental campus layout that would be worthy to be considered as a Modernist equivalent to the Army's Gothic Revival campus at West Point, New York, and the Neoclassical Revival U.S. Naval Academy at Annapolis, Maryland.

Figure 33. Vandenberg Hall (built 1956–1962), U.S. Air Force Academy, Colorado, designed by SOM
Photo by Hedrich Blessing, ca. 1962

In contrast to Figure 34, this photograph of the Vandenberg Hall cadet dormitory shows the more complicated aspects of SOM's exteriors in the Cadet Area. Like Fairchild Hall, Vandenberg has a pattern of structural framing with the spaces between filled in with metal-framed glass panels. The overall forms are cubic, but the potentially boxlike form of the building is broken up by a recessed floor that in this photograph contains a staircase. This recessed floor not only divides up the boxlike form of the building, it also adds to the building's sense of weightlessness. This is a good example of how SOM's designers used cantilevered construction to achieve striking visual effects. The themes of lightness and weightlessness are repeated throughout SOM's design for the Cadet Area, as well as the use of a standard geometrical grid for the dimensions of the major elements of the buildings, site planning, and landscaping.

Figure 34. Fairchild Hall (built 1956–1962), U.S. Air Force Academy, Colorado, designed by SOM
Photo by Hedrich Blessing, ca. 1962

The angle of this photograph gives Fairchild Hall, the main classroom building, a cubic, Miesian appearance. From this angle, the building seems boxlike in form with a highly regular grid composition on each wall. The spaces between the framing elements are filled in with glass or stone veneer. Note that the building is recessed on the first floor and supported by thin posts (pilotis), a technique often used by Mies that gives the building a floating, weightless quality.

Figure 35. Vandenburg Hall (built 1956–1962), U.S. Air Force Academy, Colorado, designed by SOM, courtyard area
Photo by H. LaPlant, ca. 1962

This view shows the somewhat complex multi-level configuration of the interior courtyard areas of Vandenburg Hall, and that the buildings of the Cadet Area are not simple glass boxes, but instead have many sophisticated design features.

Figure 36. Mitchell Hall (built 1956–1962), U.S. Air Force Academy, Colorado, designed by SOM, dining area interior
Photo by Bill Hedrich/Hedrich Blessing, ca. 1962

Mitchell Hall is the cadet dining facility. Here, steel trusses have been used to create a large open dining space, with natural light coming in from extensive use of glass curtain walls. Since the glass walls are without thick support posts, the interior space gives the ceiling a floating quality.

Although landscape design is not the main focus of this context, it should be mentioned that the landscape is an important part of the Air Force Academy design, and the buildings cannot be discussed without noting how they relate to the designed landscape of the Cadet Area. Eminent landscape designer Dan Kiley created a landscape for the Cadet Area that included a grid-like plaza (the Terrazzo) based on the 28-foot square dimensional module that SOM used as a basis for the design of the buildings. The original major buildings of the Cadet Area campus—Vandenburg, Fairchild, Mitchell, Arnold, and Harmon Halls—were oriented around the Terrazzo. A 700-foot portion of the Terrazzo was known as the Air Garden and contained a series of trees, geometrical walkways, lighted pools of water, and fountains. The geometry of the Air Garden was meant to reflect the highly structured life of the Air Force cadets. On the south end of the Terrazzo, the hill slope was not terraced with granite slabs but was landscaped with a series of trees that blended into and complemented the surrounding natural mountain landscape. This sloped area was destroyed in the late 1960s when the Sijan Hall dormitory was constructed (Hosington 2003:38–40). The Terrazzo, Air Garden, granite walls, and other site features of the Cadet Area are an important visual component of its character. The landscape and buildings of the Cadet Area are tightly integrated, and both elements are essential to the design.

Several of the buildings of the Cadet Area have a Miesian feel, especially Vandenburg, Fairchild, and Harmon Halls. The campus was also designed based on a 7-foot square dimensional module. Most dimensions of elements of the designs were based on multiples or fractions of the number 7. The size and shape of each building and spacing between buildings was determined by multiplying 7 times 4 to get a 28-foot-square module. The dimensions of smaller elements like paving squares or building details were determined by dividing the number 7 in half, quarters, or eighths (Hosington 2003:35).

The modular concept was reportedly initially developed by Le Corbusier, and modular concepts were used for several campus designs in the United States in the fifteen or so years before the design of the Cadet Area. A module had been used by Mies for the 1939 IIT layout and for the design of subsequent buildings there built in the 1940s and 1950s, and had also been used by Eero Saarinen at the General Motors Technical Center built from 1949–1955. The module was also used in several SOM projects that were designed just before the Cadet Area, most notably at the Connecticut General Insurance Headquarters campus. The buildings of the Cadet Area are also all positioned at right angles to each other; no building is positioned at a diagonal or skewed angle, another similarity with both the IIT and General Motors Technical Center campuses (Hosington 2003:35–36).

The Cadet Area does have Miesian features, such as the modular grid and some aspects of the exterior design of some of the buildings, but overall, it is a distinctive arrangement of buildings and landscape features that cannot simply be categorized as Miesian. The hilly topography of the site is used to make the building look strikingly different from various viewpoints and elevations, and SOM gave many of the buildings a distinctive weightless appearance through cantilevered construction and sophisticated use of glass. The campus layout and building forms are in some ways closer to Eero Saarinen's ca. 1949 General Motors campus plan at Warren, Michigan, and the Chapel's sharp vertical forms certainly do not conform to Miesian principles. The use of the granite retaining walls and stone veneer on

the buildings are also a response to the topography and visual character of the site, and a desire to lend a sense of monumentality to the campus.

Due to the position of the buildings on a ridge and the use of granite retaining walls to terrace the site, the Cadet Area has also been described as a Modernist Acropolis (Hosington 2003:7). Another distinctive characteristic of the Cadet Area is the tendency for the buildings to have a floating appearance, created by the extensive use of exterior glass and recessed first floors supported on thin pilotis. This feature is somewhat Miesian, but it is carried out in an innovative way.

The Cadet Area is still used by the U.S. Air Force Academy, but the layout has had some additions, and some buildings have been modified. The Cadet Area was determined eligible for the National Register in the 1990s and was designated in 2004 as a National Historic Landmark, the highest level of historic designation offered by the National Park Service. Efforts are now underway to preserve the historic character of the Cadet Area while making modifications that continue to allow it to be a safe and efficient educational facility for academy cadets.

While the U.S. Air Force Academy may have been the most high-profile military campus of the late 1950s and early 1960s, other training facilities were being built by the DoD at that time, and interesting comparisons can be drawn between them and the Air Force Academy. For example, the Navy's Recruit Training Command (RTC) area at Great Lakes, Illinois, was designed in 1957 by the Chicago firm of Pace Associates. This new campus represented a massive reconstruction of the RTC, which was the main facility that provided basic training to enlisted Navy recruits. Before the modernization that began in 1957, RTC was still housed in aging wood-frame World War II temporary buildings, so updating the campus to modern military training standards was a high priority.

The campus plan and buildings for RTC are much plainer in architectural character than the U.S. Air Force Academy Cadet Area, and there is less emphasis on monumentality (U.S. Navy 1970). Much of the Pace Associates layout for the new RTC campus consisted of large, massive, reinforced-concrete frame barracks of a consistent three stories high. Each barrack had a recess at the center that somewhat broke up the overall massiveness of the exterior. The three-story barracks were massed in groups of three and four buildings, interspersed with lower, smaller buildings.

The plan also contained several smaller, more irregular support buildings. A grid street layout had been established for the campus during World War II, and several wartime buildings (including three massive World War II laminated wood-arched drill halls) were retained as part of the RTC redevelopment. Each of the new barracks buildings was large, massive, and boxlike, and each contained two interior courtyards to form a figure-8 layout. The fourteen uniform barracks buildings and the associated support structures were packed into a dense, grid-based campus plan. Using a regular grid plan was practical for this site, since in contrast to the mountain foothill terrain of the U.S. Air Force Academy, the site of RTC was mostly flat.

The large size of the RTC barracks and the horizontal lines of the buildings created an impressive sense of scale. The use of the courtyards to produce buildings with massive boxlike exteriors is similar to Mies's 1938 IIT campus design and also to the configurations of Vandenburg and Fairchild Halls at the U.S. Air Force Academy. The RTC campus plan also uses a very regular geometrical plan, another similarity to IIT, with buildings located on a fairly regular street grid and positioned at right angles to each other. It is possible that a module was used to determine the size and placement of the buildings. The fourteen RTC barracks were largely identical with a uniform height, giving the complex a sense of consistency of scale and design that seems Miesian. The regularity of the campus architecture at RTC may have some of the factory-like industrial feel that SOM was trying to avoid with the more monumental design of the U.S. Air Force Academy.

The barracks and most of the main support buildings at RTC built between 1958 and 1963 were constructed with reinforced-concrete structural frames that were exposed on the exterior. The exposure of the concrete framing elements is similar to Mies's early 1940s laboratory buildings at IIT, but the RTC buildings have rows of ribbon windows interspersed with bands of buff-colored brick, reinforcing the horizontality of the buildings, instead of the grid of glass and brick panels used at IIT. The Pace barracks design was also somewhat conservative. The ribbon windows give the design a sense of horizontal flow and an industrial feel. However, each building also has large sections of brick wall that give the buildings a sense of heaviness, and the buildings do not show a lot of imaginative use of structural techniques like glass curtain walls or cantilevering.

From 1958 to 1962, the first wave of barracks at RTC had the reinforced-concrete frame of the buildings on the exterior, but by ca. 1964, this exposure of the structural frame was no longer considered important, and the barracks were redesigned so the concrete frame was hidden behind brick curtain walls. Other RTC campus buildings such as the mess halls also had brick side walls, while the fronts of these buildings were composed of a metal-grid frame fitted with doors, windows, and porcelain-coated steel panels. The RTC auditorium was a largely windowless brick box.

The last RTC barracks were finished in 1966, during the Vietnam War. The completed RTC was the Navy's main recruit training center through the rest of the Vietnam War years, the late Cold War years, and into the post-Cold War years of the 1990s. A second redevelopment of RTC began in the 1990s and was completed incrementally. Today, almost all of the 1958–1966 buildings at RTC have been demolished as part of the recent redevelopment project. However, the 1958–1966 RTC project was important in its time as a large-scale military training campus whose practicality and conservatism contrasts with the monumentality and high-style Modernism of the U.S. Air Force Academy's Cadet Area.

Another major project designed in the late 1950s was the Strategic Air Command (SAC) Headquarters at Offut Air Force Base near Omaha, Nebraska (Figure 37). The main SAC headquarters building was designed by the Leo A. Daly firm of Omaha, Nebraska, in 1955, and built in ca. 1956–1957 (Pike 2000). The project included a large headquarters and administrative building for SAC, and a chapel. The aesthetics of the headquarters building are not remarkable; the building had a center pavilion and long wings with ribbon windows. The building's exterior was composed of a reinforced-concrete frame and buff-colored brick infill. The exterior design was therefore somewhat conservative for the time.

Other features of the building were more remarkable, however. The SAC Headquarters had a three-story basement built with hardened concrete to resist nuclear attack (Figure 38). This basement area, known as the "molehole," also contained the large display board that kept high-level Air Force officials alerted to the status of Soviet and NATO strategic aircraft and missiles around the globe (Pike 2000). The Leo A. Daly firm received a significant amount of federal government work in the 1950s and 1960s, and they designed some of the additions to the U.S. Air Force Academy campus that were constructed in the 1960s.

Since Miesian design and Modernism in general were promoted in the 1950s as a form of architecture that could be mastered by any designer, a wide variety of architects embraced a more conservative form of Modernism in the 1950s and early 1960s (Adakov et al. 2010:134, Wilson 1984:70). As a result, many Modernist buildings in the mid-to-late 1950s and later exhibit some characteristics of Modernism, and especially Miesian design, but do not have the level of aesthetic refinement and attention to proportion and detail seen in the more refined military projects of SOM and other high-style Modernist designers. There are many of these buildings all over the United States.

Many of the examples of this style or approach include buildings that are cubic in form, with concrete exteriors, but with individual windows punched into the walls. Sometimes less attention is paid to the geometry of the building's exterior; proportions and lines are not as carefully delineated; and the exterior configuration and placement of windows is sometimes determined by practical considerations, while the visual effect of these features is not as well thought out as it might be on a high-style Modernist building. The exteriors of some of these buildings are veneered in brick, and in many cases, the exterior appears as a series of brick walls with small windows, a reversion to a more traditional way of composing a building's exterior.

Thousands of these buildings were designed by architects at lesser-known architectural firms, but sometimes the more well-known firms also designed buildings that were less carefully designed examples of cubic Modernism. These buildings, commonly dating to the 1950s through the mid-1960s, are fairly conventional buildings and not very exciting in terms of design. They often show exterior reinforced-concrete structure on their exteriors, but the outsides of the buildings are cubic and often composed of brick walls with a very regular series of punched-in windows. These buildings are conservative in design and contain few of the features that can give Modernist buildings a sense of visual excitement or monumentality. These types of conservative Modernist buildings are present all over the United States. The fairly low quality of design in many of these buildings is one of the factors that eventually led critics to question the suitability of Modernism, beginning in the later 1960s and extending through the 1970s and 1980s.

Figure 37. Strategic Air Command Headquarters (built 1956–1957), Offut Air Force Base, Nebraska, designed by Leo A. Daly, aerial view

U.S. Air Force Photo, 1958, from the George Washington University National Security Archive

The exterior of the building is somewhat conservative, with boxlike forms and brick walls punctuated with regular rows of ribbon windows. Contrast this exterior with the cantilevering and distinctive use of glass and metal in the U.S. Air Force Academy Cadet Area buildings.

Figure 38. Strategic Air Command Headquarters, Offut Air Force Base, Nebraska, designed by Leo A. Daly, view of interior

U.S. Air Force Photo, 1961, from the George Washington University National Security Archive

This image shows the basement area with the status board for displaying the global status of aircraft and missiles.

Several examples of this more conservative type of Modernism exist at Wright-Patterson. The installation hospital in its original 1950s form (Building 10830) is a good example of this approach to design (Figure 39). The original building was constructed in 1958 and designed by the U.S. Army Corps of Engineers, Louisville District. The influence of Modernism is evident in the building's cubic form, lack of applied ornament, and extensive use of exposed concrete on the exterior. However, aesthetically, the building's use of punched-in windows is conservative. Also, the building's massing is composed of a series of concrete boxes of different heights. The building shows no imaginative use of glass, cantilevering, a recessed first floor to create a sense of lightness, or a strong composition containing areas of deep shadow. The conventional forms are not particularly distinguished in terms of Modernist design. The building survives today, although several large additions and extensive remodeling on the exterior have rendered it nearly unrecognizable.

There are many examples of this type of construction on military bases everywhere, and the trend toward design and construction of this type of building extended well into the 1960s. Wright-Patterson Buildings 10825 (built 1954) and 10826 (built 1959, Figure 40) both now used as Visiting Officers' Quarters, are two more examples of fairly conservative Modernist design.

LOUISVILLE DISTRICT, CORPS OF ENGINEERS, U. S. ARMY. Date: 2 October 1958 File No. 30912
Wright-Patterson Air Force Base, Dayton, Ohio. Aerial view of Air Force Hospital.

Figure 39. Building 10830, Hospital (built 1958), Wright-Patterson Area A, designed by the U.S. Army Corps of Engineers, aerial view

Photo by U.S. Army Corps of Engineers, 1958 (provided by 88th Air Base Wing History Office)

This building's boxy massing, lack of cantilevering or dramatic use of glass and concrete for visual effect, and the solid-looking concrete walls punctuated with a series of punched-in windows, mark it as a fairly conservative example of

Modernism that has a fairly low level of architectural distinction. This hospital was likely based on a U.S. Army Corps of Engineers standard hospital design that may have been executed at several different Air Force installations. Many buildings were designed during the 1950s and 1960s in a somewhat plain, conservative interpretation of the Modernistic design approach. These facilities are normally not eligible for the National Register under Criterion C unless there is an unusual consideration, such as a significant engineering or construction technology advance associated with the building.

Figure 40. Building 10826 (built 1959), Wright-Patterson Area A, designed by Joseph & Joseph Architects
Photo by U.S. Army Corps of Engineers, Louisville District, 1959 (provided by 88th Air Base Wing History Office)

This building shows another fairly conservative symmetrical exterior composition with brick curtain walls and small punched-in windows. Thin stone trim pieces have been used to draw horizontal boxes around the rows of windows to create a fairly weak approximation of a ribbon window effect. It may be useful to compare this photograph and Figure 39 to the photographs of buildings at the U.S. Air Force Academy (Figure 32 to Figure 36, beginning on page 50) to get a sense of how 1950s high-style Modernist design contrasts with buildings from the same era that are of a more conservative nature.

It should be noted that architectural Expressionism was seeing some traction during this period, but the style did not appear to have much of an influence on American military design. (A more detailed discussion of Expressionism in the 1960s–1970s is presented on page 101). Expressionism is characterized by curves and dramatic effects, such as broad overhangs or forms that seem to float.

The style may have been considered too flamboyant by most military planners to be used in military buildings other than chapels. Non-military examples of Expressionist buildings from this time period include air terminals at the Kennedy and Dulles airports that were designed by Eero Saarinen in the late 1950s and built in the early 1960s. These buildings had curved rooflines and dramatic sweeping forms that suggested the motion of flight. In American DoD buildings, the Chapel at the U.S. Air Force Academy (Figure 31, page 48, and Figure 47, page 67), with its sweeping triangular

vertical forms, seems to have some Expressionist sensibilities, and there may be other military chapels of the era as well. However, DoD administrative, educational, training, medical, and recreational buildings do not seem to have been heavily influenced by architectural Expressionism.

1964–1975: New Movements Reach the Military—Brutalism, New Formalism, and Expressionism

Miesian design continued into the 1960s, but by the mid-to-late 1960s, several other architectural movements began to filter down into American architectural design. Two of the strongest movements were Brutalism and New Formalism. Both had their origins earlier in the 1950s and early 1960s, but it is in the last half of the 1960s that these movements reached their peak in the United States and began to influence DoD buildings. Architectural Expressionism also continued as a movement during this period, although it does not appear to have had widespread influence on DoD architecture.

Brutalism

Brutalism as an architectural movement was formed in Great Britain in the 1950s (Frampton 1992:266–267). The British architectural critic Reyner Banham defined Brutalism as having three major points (Banham 1966:127):

- "The building as a unified visual image, clear and memorable"
- "Clear exhibition of its [the building's] structure"
- "A high valuation of raw, untreated materials"

Other phrases that were used to describe Brutalism in the 1950s were "clean virgin surfaces," "heavily corrugated volumes, but of prismatic simplicity," and "services exposed to view" (Banham 1966:127). Clearly, the idea was that the buildings needed to show structural materials, preferably ones that were rough. Large, clear shapes were also valued over small details. A bold visual appearance for the building was a high priority in the design of Brutalist structures.

The Brutalism movement was one where honesty and exposure of the functional elements of the building were prized. A Brutalist design would expose the structural materials that held up the building but might also expose other necessary and functional elements, such as pipes or ventilation ducts. The whole idea was to express a sense of honesty by showing the viewer the guts of the building—what held it together structurally and what made it function—while at the same time creating an interesting, visually striking design. In the United States, the result was buildings that typically showcased bold geometrical exterior and interior forms, with large expanses of exposed structural concrete on the exterior. Buildings of this description became very common in the late 1960s and early 1970s, as the movement reached its peak in the United States.

One of the early American figures of Brutalism was Paul Rudolph, who had studied architecture under Bauhaus designer Walter Gropius. Rudolph was appointed chairman of the Yale School of Architecture in 1958, and in 1958–1959, Rudolph undertook design work on an art and architecture building for Yale, which was completed in 1964. On the exterior, the

building featured a complex composition of massive vertical and horizontal concrete elements that were large and rough textured (Roth 2001:446–447). This building seems to have inspired a whole generation of Brutalist government, corporate office, and commercial buildings in the United States during the last half of the 1960s. The 1962 design by Kallman, McKinnell & Knowles for Boston City Hall (Figure 41) is another influential and early American Brutalist design, although the building was not completed until 1968.

In the United States, Brutalism was most commonly used for large and medium-sized government-funded buildings, and university buildings, government centers, museums, and hospitals showing the influence of Brutalism can still be found in many communities. The form of these buildings was different from the glass boxes commonly used for corporate office buildings, providing a distinctively different and readily recognizable architectural form for government buildings (Curtis 1996:515–516).

Figure 41. Boston City Hall (built 1962–1968), Massachusetts, designed by Kallman, McKinnell & Knowles
Photo by Roy Hampton, Hardlines Design Company, 2011
This building shows the bold exterior use of rough-textured exposed concrete and the dramatic cantilevered construction and bold geometrical forms that are commonly associated with high-style Brutalism.

In addition to the Boston City Hall, the 1966–1970 Ohio Historical Center in Columbus (Figure 42) is also a notable example of a large and prominent public building in the Brutalist style. The bold forms of the buildings and the use of exposed masses of concrete rather than a delicate skin of metal and glass were in strong contrast to the glass box corporate towers and apartment buildings of the 1950s and 1960s that were influenced by Miesian design tendencies.

The building was designed by a relatively new architectural firm, Ireland & Associates, which was composed of Columbus architect W. Byron Ireland and associates Dick Eschliman and George Bulford. Ireland had graduated from the Harvard Graduate School of Design and been employed as a senior designer for eminent Modernist architect Eero Saarinen. The Ohio Historical Center incorporates local influences into its design, a distinctive aspect of Ireland's work that goes beyond the usual poured-concrete aesthetic of many other Brutalist buildings. For example, a large mound of earth at the main entrance of the center is reminiscent of the work of the Native American mound builders who constructed significant earthworks around Ohio in prehistoric times. Also, the brown masonry blocks of the central box's exterior walls were made in Ohio, and were a material used to build agricultural silos, a type of structure seen on many of the state's numerous rural farms. The building was, at the time of its completion, extensively praised by architecture critics as having a bold and imaginative design (Ohio Historical Society 2010:2–3).

Figure 42. Ohio Historical Center (built 1966–1970), Columbus, designed by Ireland & Associates
Photo by Roy Hampton, Hardlines Design Company, 2011
This exterior also shows bold use of poured concrete, heavy cubic forms, and cantilevered construction. The mix of poured concrete with dark brown masonry block is a highly distinctive feature of this building's exterior.

Brutalism's apex in the United States was from the mid-1960s to the early 1970s, but the movement was soon criticized for subordinating human needs to concerns about the form and shape of buildings. Many Brutalist buildings had roofs and windows that leaked and dark interiors with little natural light. Sometimes, the interiors of the buildings contained large cavern-like spaces dominated by exposed poured concrete, and the lack of natural light and the gray tone of the exposed concrete at times seemed dark and cold. In many cases, the

public did not find the massive geometrical forms and rough concrete surfaces of these buildings to be pleasing visually. These factors led to criticism of the movement (Roth 1983:446–447), and by the late 1970s, the movement had dissipated, although buildings of the last half of the 1970s continued to exhibit some of the rough and massive, poured-concrete exterior forms that had been popularized through Brutalism.

Building 20620 in Area B of Wright-Patterson is an interesting and distinctive example of Brutalism from the end of the 1960s (Figure 43 and Figure 44). The building contains a series of exterior cubic concrete massed with rough textures, as is typical of many buildings of this movement. The most striking feature of the building is the tower, which is composed of two massive shafts of reinforced concrete, bridged over at the top by four concrete slabs. The tower has a striking visual effect, with the strong vertical lines of the shafts counterbalanced by the overhanging concrete slabs that create deep horizontal shadows. In some ways, the building is a good example of the movement, except that the tower shows a high degree of

Figure 43. Building 20620 (built 1966–1967), tower, Wright-Patterson Area B, designed by Dalton & Dalton
Photo by Roy Hampton, Hardlines Design Company, 2011
The exterior is composed of heavy concrete geometrical forms, many of which have a texture composed of a series of vertical lines. In many parts of the building, horizontal banks of dark aluminum windows are sandwiched between the massive concrete beams. The bold sculptural quality of the top of the tower is the building's most distinctive exterior feature.

Figure 44. Building 20620 (built 1966–1967), south wall, Wright-Patterson Area B, designed by Dalton & Dalton
Photo by Roy Hampton, Hardlines Design Company, 2011

creativity and is distinctive; the Brutalist movement typically featured massive horizontal forms rather than soaring vertical ones.

The designers of the building were Dalton & Dalton, Architects and Engineers, of Cleveland, Ohio, and the building served as an Avionics and Electronic Warfare Research facility. The tower is twelve stories tall with laboratory facilities located between the four concrete slabs on the tower's tenth, eleventh, and twelfth stories (Hay et al. 1995). The building was assessed in 1995 (Hay et al. 1995) for Cold War significance in technological research, but at that time, the Modernist architectural design aspects of the building under Criterion C were not addressed.

New Formalism

Another movement that originated in the 1950s and achieved widespread popularity in the 1960s was New Formalism. In this movement, buildings were still designed with modern materials, and sculpted details and moldings were not included. However, the overall proportions and layouts of the buildings were influenced by traditional ideas of Classical balance and symmetry, and sometimes simple abstracted Classical elements like arches were included. In contrast to the massive, often blocky forms of Brutalism, New Formalist buildings often had well-ordered compositions with a clear definition of the base, middle, and top of the building, a tendency inherited from Classical architecture. The idea was not to revive the details of Classical architecture but instead to apply a sense of Classical balance and order to buildings that were still modern, with simple unornamented forms and modern materials. These buildings often have symmetrical front porches with square posts, a feature that recalls the porticos of Classical buildings, and the porches are often veneered in stone or executed in light-colored poured concrete to achieve a stone-like effect.

A good example of New Formalism is Wallace K. Harrison's Metropolitan Opera House at the Lincoln Center for the Performing Arts in New York City; the facade of this building features a portico with six columns topped off by a row of five round arches. The building is positioned on a plaza with steps and a central fountain, and the opera house is flanked on each side by a building with a columned portico. The Metropolitan Opera House is simple and abstract, using modern materials like glass and reinforced concrete, and it does not include any traditional Classical decoration. However, the symmetry of the portico and plaza and the use of round arches evokes associations with the traditional architecture of ancient Rome and the Italian Renaissance. The traditional dignity hinted at by these buildings was seen to be especially appropriate for arts facilities like theaters.

One of the pioneer architects of the New Formalism movement in the United States was Edward Durrell Stone, a designer who was well known for his designs for government and public university buildings. Stone began giving his Modernist buildings a sense of Classical form and proportion in the 1950s, with the United States Embassy in New Delhi, India, (1957–1959), the U.S. Pavilion for the Brussels Exhibition, Belgium (1958), and later the Cleveland Jewish Federation Headquarters (1965, Figure 45).

Figure 45. Cleveland Jewish Federation Headquarters (built 1965), Cleveland, Ohio, designed by Edward Durrell Stone and Weinberg and Teare

LPhoto by Roy Hampton, Hardlines Design Company, 2012

The symmetrical facade, arched windows, and overhanging cornice give this building a sense of Classical dignity, while the architectural forms, details, and materials are still unmistakably Modernistic.

Figure 46. Building 31239, Base Theater (built 1966), Wright-Patterson Area A, designed by Daniel, Mann, Johnson & Mendenhall

Photo by Roy Hampton, Hardlines Design Company, 2011

Since this building is a theater, the designers perhaps felt the need to provide it with a sense of Classical dignity, most likely under the influence of the New Formalism movement. The designers placed a symmetrical six-column portico on the front of the building. While the portico has a somewhat dignified appearance when the building is viewed head-on, at an angle, one can see that the portico is applied to a false two-story facade that sits in front of the one-story theater lobby, a somewhat unconvincing and clumsy application of New Formalism principles to what is an otherwise plain, boxlike exterior.

New Formalism seems to have filtered down to many architects working in the United States during the early to mid-1960s. For example, Daniel, Mann, Johnson & Mendenhall's 1966 Base Theater at Wright Patterson (Building 31239, Figure 46) is a plain brick and concrete box, but a six-column portico has been included on the front of the building to give it a sense of Classical dignity, clearly based on the influence of New Formalism. Note, however, that the first-floor lobby of the building behind the portico is only one story tall. A parapet wall had to be added to the front of the building to give the portico enough height to achieve a suitably impressive architectural character. The illusion is effective when the building is viewed head-on, but when viewed at an angle, as in Figure 46, the portico and the brick wall behind it appear as a type of false facade.

Expressionism

Another important design tendency in the 1960s and early 1970s was Expressionism. Expressionist buildings had been designed in Europe during the early twentieth century and probably served as inspiration for the Expressionist buildings that were designed in the 1950s through the 1970s in the United States. This type of design was vastly different from the cubic forms of Miesian design or the Classical symmetry and geometry of New Formalism, instead featuring buildings that used unusual shapes and curved and sweeping forms. Since the movement was more of a design tendency than a coherent architectural movement like Brutalism or New Formalism, examples of Expressionism date from the 1950s up through the 1970s.

The style seems to have experienced an upswing in the United States after the 1962 completion of two projects by Swedish-born Eero Saarinen: the TWA Terminal at Kennedy Airport in New York City, and the Dulles Airport in Chantilly, Virginia, outside Washington D.C. Saarinen had designed The Kennedy TWA terminal in 1956 and Dulles Airport in 1958; both projects were completed a year after Saarinen died in 1961. In the case of both of these projects, the lightness and the curving, sweeping forms of the buildings were intended to represent the concept of flight and air travel (Jacobus 1966:160). The thin sweeping forms of these buildings and other Expressionist buildings of the 1960s were made possible, at least in part, by technological developments in concrete technology that allowed for thin, lightweight curving forms that would not have been possible in the past.

The DoD did not use the movement of Expressionism very much for architecture, probably because it was viewed as too experimental and unconventional. Few DoD buildings were identified during research for this project that appeared to have strong elements of Expressionism. Some chapels may have had Expressionist elements, since the spiritual nature of these buildings may have been seen as a more appropriate venue for less-conventional architectural expressions.

While the overall Cadet Area of the U.S. Air Force Academy could not be characterized as Expressionist, the Chapel (Figure 47) does reflect some aspects, due to its soaring triangular exterior forms and sweepingly vertical main interior space. Because of the spiritual nature of chapels, these buildings are the DoD building type that is most likely to have aspects of the Expressionist movement in the design.

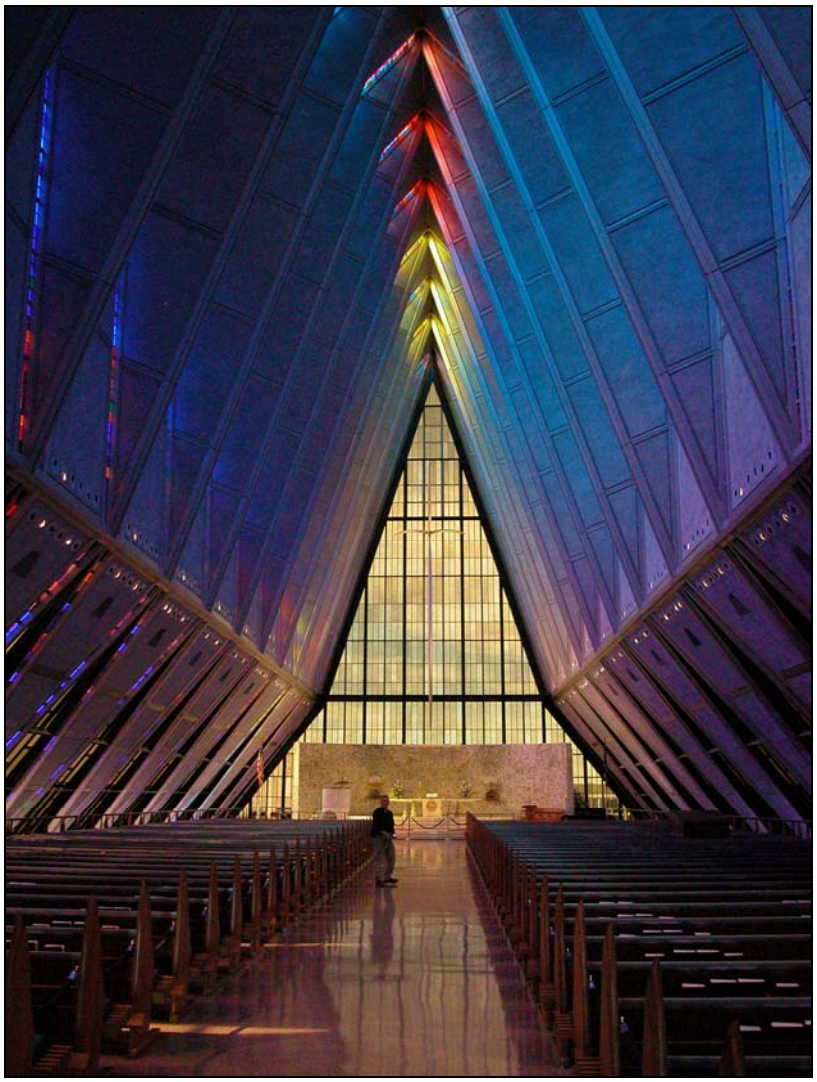

Figure 47. Chapel (built 1956–1962), U.S. Air Force Academy, Colorado, designed by SOM, interior view
Photo by Skidmore, Owings & Merrill
This interior view shows the Expressionist character of the sweeping vertical forms of the Chapel's interior. Colored light from stained glass adds to the effect and recalls the cathedrals of the Middle Ages, but the building's triangular geometry is unmistakably Modernistic.

Epilogue

This context has covered the mid-century years of the twentieth century, so as to include buildings that have passed the fifty-year mark or are within 10–12 years of reaching it. The construction dates of those buildings therefore end with 1975. The developments that took place in the military architecture of the late 1970s and 1980s is beyond the scope of this study, but a few words are included here.

After 1975, buildings at military bases continued to be designed with Modernist influence, but by the 1980s, the Post-Modern movement of the 1970s had begun to filter down into conventional architectural design in the United States. Designers of the Post-Modern movement used traditional architectural forms of the past in an ironic or unconventional way. A well-known example of this trend is Phillip Johnson and John Burgee's 1984 AT&T Building (now the Sony Center) in New York City. This building is a traditional box-like skyscraper, but it is fitted at its top with a simplified version of a broken pediment, a feature often associated with buildings and furniture of the Colonial Revival and English Baroque architectural styles. The positioning of the broken pediment at the top of the building hints

that the tower is like a giant piece of Colonial Revival furniture. At the time of its completion, the building struck a strong contrast with many of the more restrained Modernist glass box towers that surrounded it, and paved the way for the acceptance of other Post-Modern building designs later in the 1980s.

As the Post-Modern style began to influence the designers of shopping malls and tract housing, more conservative designers added traditional forms and details to buildings in a way that reflected more conventional uses of these details, often avoiding the irony and eccentricity of high-style Post-Modernism. This traditional-looking architecture of the 1980s, 1990s, and later would have seemed bizarre and unacceptable during the 1960s and the early portion of the 1970s. Many of the traditionally styled buildings returned to old-fashioned proportions and details, and it was common to have old-style wood trim items such as columns and moldings that were fabricated in modern synthetic materials like vinyl and stucco. This architecture of the 1980s and 1990s, frequently known today as Neo-Traditional, often reflects early Modern architectural movements like Industrial Modernism or Art Deco, but it also imitates pre-Modern styles like Colonial Revival, Spanish Revival, and Neoclassical Revival. Neo-Traditional buildings are still being constructed today in communities across the United States.

The fascination with appropriation of past architectural styles remains in force today, but among many architects, the influence of Modernism has surged in the last fifteen years as the forms of traditional architecture have been repeated over and over again. The renewal of interest in architectural Modernism has spread now to the public, and there is a new interest in preserving building exteriors, interiors, and furniture that dates to the 1950–1975 years and reflects the influence of Modernism and its associated movements.

ELIGIBILITY FOR THE NATIONAL REGISTER OF HISTORIC PLACES

Overview of National Register Standards for Evaluation

The framework for evaluating buildings or groups of buildings for National Register eligibility is provided by the National Park Service, particularly in *National Register Bulletin 15, How to Apply the National Register Criteria for Evaluation* (Andrus and Shrimpton 2002). Other publications by the National Park Service are also relevant, especially *National Register Bulletin 22, Guidelines for Evaluating and Nominating Properties That Have Achieved Significance Within the Past Fifty Years* (Sherfy and Luce 1998), which provides guidance on completing National Register nomination forms.

This document is concerned primarily with the eligibility of buildings for architectural merit or engineering significance under National Register Criterion C. This guide does not focus on the Cold War military function of these buildings, except in consideration of how the function relates to the design of the building and its architectural or engineering significance. Although the main emphasis of the study is of individual buildings, some brief discussion is also included on the possibility of historic districts with multiple buildings and significant landscape and site planning features.

The National Register evaluation guidelines (Andrus and Shrimpton 2002) split the significance of properties into four areas, known as evaluation criteria and identified with letter designations of A through D:

Criterion A: Concerns the significance of the property as it relates to historical events or historical patterns and trends

Criterion B: Concerns the significance as it related to persons important in history

Criterion C: Concerns the significance as it relates to design, artistic merit, or engineering

Criterion D: Concerns the significance as it relates to the potential to provide additional significant historical information

In addition to the above criteria, there is also a series of National Register Criteria Considerations that can be applied to facilities in special circumstances. These criteria considerations are also designated by letters of the alphabet, ranging from A through G. Many of them are not highly relevant to military buildings of the 1950–1975 years, but Criteria Consideration G applies to properties that have not yet turned fifty years old and so is especially relevant for architectural Modernism evaluations at this time.

To be eligible for the National Register, a building or group of buildings generally must meet one of the four National Register criteria listed above, and it must also have integrity, which means that the building must retain enough original features and characteristics that it can still give people a sense of the time and place in which the building was created, or the time and place during which the building became historically significant. The National Park Service sets out seven aspects of integrity in their literature on National Register eligibility: location, design,

setting, materials, workmanship, feeling, and association. When considering a building's significance under Criterion C, the aspects of integrity are applied to a property in a somewhat different way than they would be applied to buildings being considered under Criteria A, B, or D. There are also some specific considerations that must be taken into account when dealing with Criterion C in relation to architectural Modernism. These ideas are discussed in more detail in this section. This material is adapted from *National Register Bulletin 15*: *How to Apply the National Register Criteria for Evaluation*, by Patrick Andrus and Rebecca Shrimpton, 2002.

Note on Cold War Significance

A number of existing guides discuss the historical significance of military buildings related to Cold War events or military trends that are associated with buildings from the 1950–1975 time period, in terms of the significance of these buildings as they relate to the military mission they performed and how they fit into the broad historical patterns of American history of the Cold War era. A separate bibliography listing these sources is included in this study as "Appendix B: Sources Useful in Assessing the Cold War Historic Significance of Military Buildings" (page 151). Cold War historical significance is usually connected to National Register Criterion A, which covers historical events or broad historical trends or patterns, but this kind of significance could also fall under Criterion B for an important person, or under Criterion D for the building's potential for providing additional information. Please note that these areas of significance are not the main areas of emphasis in this study.

National Register Criterion C

For this guide, since we are considering the architectural and engineering merit of buildings constructed between 1950 and 1975 and the influence of architectural Modernism, Criterion C is the primary National Register criterion that comes into play.

Four Concepts Covered Under Criterion C

National Register Criterion C is concerned with design and construction: "Properties may be eligible for the National Register if they

(1) embody the distinctive characteristics of a type, period, or method of construction, or that
(2) represent the work of a master, or that
(3) possess high artistic values, or that
(4) represent a significant and distinguishable entity whose components may lack individual distinction" (Andrus and Shrimpton 2002:17).

The discussion below covers the first three of these concepts; the fourth concept, "a significant and distinguishable entity whose components may lack individual distinction" applies mainly to historic districts, although it could be applied to a single building if it is part of a small district that includes the building and a large number of related site features. This point is discussed later on page 90 in the section on landscapes and historic districts.

1. Embody the distinctive characteristics of a type, period, or method of construction

This concept states that a property is eligible if it has the "distinctive characteristics" of something like an architectural style or construction type. Note that this concept has two components to it:

1. The property must have the distinctive characteristics of an architectural style or a type of construction, *and*
2. That style or type must be considered significant in some way.

Two of the general examples given in *National Register Bulletin 15* (Andrus and Shrimpton 2002:18) are a "house or commercial building representing a significant style of architecture" and "a bridge or dam representing technological advances."

If a particular architectural style or type of construction has certain features associated with it, then buildings that have a fairly large number of those features are more likely to be eligible, whereas buildings having only a few of those features would not be especially representative of the style or type, and would therefore tend to not be eligible. The person making the evaluation must (a) identify the style or construction type being represented, (b) determine the distinctive characteristics of that style or type, and then (c) see if the example being evaluated has many of those characteristics. A certain amount of professional judgment must be used in determining which characteristics are the essential ones for a particular style or construction type, as well as how many of the defining characteristics a property must have to be eligible. For guidance on important features of many of the 1950–1975 architectural movements that may be encountered when surveying buildings from this era, see "Evaluation Guidelines," beginning on page 9569 of this document.

In addition to possessing the requisite characteristics, the property must be associated with a design style or some type of construction or engineering technique that is considered *important* in some way. Note that uniqueness alone does not make a property eligible; even if a property is the only example of its type, it is not eligible if it does not also represent a style, structural type, or architectural concept that is considered important by our society. Hence, the type or style represented by the property must have some kind of cultural importance to be eligible for the National Register. Andrus and Shrimpton (2002:18–19) use the example of a Gothic Revival house to illustrate this point. Gothic Revival is clearly considered by scholars to have been an important movement in American architectural history, so if a house has a large number of the distinctive characteristics of the Gothic Revival movement, then it should be eligible. Another example cites an Art Deco commercial building that has only some details of the Art Deco style but not the form and massing common to Art Deco buildings. In this case, the style, Art Deco, is significant, but the property itself does not have enough of the characteristics of Art Deco to be a truly good example of the style, so it is not eligible (ibid.).

A property can also be eligible if it represents the transition from one architectural style to another, if that transition is important in terms of technology or architecture. So a building could have distinctive characteristics of two architectural styles and could be eligible for the National Register if the movement of designers from one style to the other is considered important in the history of architecture. Likewise, a bridge, for example, that reflects a transition between an older structural technology and a newer one could be eligible if the

change from one structural technique to the other is considered significant in engineering history (Andrus and Shrimpton 2002:18–19).

This document presents some lists of common, distinctive characteristics for buildings associated with the various movements of architectural Modernism from 1950 through 1975. These characteristics are the types of features that a building needs to retain in order to be eligible for the National Register under Criterion C; buildings that have lost many or most of these characteristics will be less likely to be eligible under Criterion C. A brief list of movements is provided below. (See "Evaluation Guidelines," page 95, for a detailed list of the kinds of things that might be considered significant. The movements listed below are explained and defined in more detail beginning on page 36 in the Historic Context section of this guide.) Also listed below are various types of issues with construction and engineering techniques that should be considered when evaluating architectural Modernist properties.

Architectural movements and styles of the 1950–1975 period

- Late manifestations of Art Moderne or Stripped Classicism (early 1950s).
- Bauhaus-Influenced Design (1950–1975).
- Miesian Movement (mostly 1950–ca. 1965).
- Brutalism (mostly ca. 1964–ca. 1973).
- New Formalism (ca. 1957–1970).
- Expressionism (ca. 1950–1975).
- Buildings that combine aspects of two or more of these movements in a significant way

Innovations in building types and engineering techniques of the 1950–1975 period

- Innovations in materials, as in types of concrete, steel, glass, or other innovative or new materials, if their introduction was considered important in the history of construction
- Innovations in floor plans or space layouts for a particular important type of building (such as a school or theater), especially if the type was influential on later buildings of that type
- Innovations in construction or engineering techniques, such as a new way of pouring concrete or using prefabricated elements, that had an important influence on how construction technology developed

To follow the pattern of Andrus and Shrimpton in *National Register Bulletin 15*, a 1950s building that retains many essential characteristics of a Modernistic movement, such as the Miesian movement, for example, would likely be eligible, because historians widely agree that the Miesian movement is important in American architecture, and the building has the characteristics of the movement that make it a good example. The same would be true for buildings that have many of the essential characteristics of any of the Modernistic movements of the time period covered here, such as New Formalism, Brutalism, and Expressionism, and others. Some other hypothetical examples are as follows:

- A mid-1960s Navy training building might be eligible if it featured a new type of classroom layout that made training more effective. If the building still retained this interior layout, and it was proven that the layout was considered an important development in the design of military training facilities (and especially if this innovation influenced later designers of other training buildings), then this property would be eligible as long as it retained the interior layout. If the innovative features of the interior

layout had been destroyed by remodeling, then the building could not be eligible in association with this feature.

- If a building is one of the earliest examples where a particular type of prefabricated concrete slab construction was used, then such a building could be eligible. The building would need to retain the characteristics of this type of concrete prefabrication, and the technique would probably need to have been published in widely circulated construction journals, or at least have been influential on later builders using prefabricated concrete.

- A building that had definitive characteristics of both Miesian and Brutalist architectural movements might be eligible if the building is a good illustration of the way in which American architects integrated the two movements as the influence of Brutalism began to grow in the United States during the 1960s.

2. Represents the work of a master

This concept means that the building must be a significant work of an architect, engineer, or design firm that is considered important in the history of American architecture or engineering. Like the previous concept, there are two components:

1. The architect, engineer, or design firm must be significant, *and*
2. The building must be a significant work of that master.

The designer or firm could be considered important nationally or at the state or local level. Hence, buildings by famous Modernist architects like Frank Lloyd Wright, Richard Neutra, Louis Kahn, or Edward Durrell Stone could be eligible, as could properties by lesser-known but influential regional designers. Architectural firms like Skidmore, Owings & Merrill (SOM) can be cited under the "work of a master" concept, since a number of firms were considered to be very important in the history of American Modernism. Again, some judgment is required when assessing if an architect, engineer, or company has a strong enough reputation at the local level to be considered significant enough that their buildings could be eligible as the work of a master under Criterion C.

The building itself must not have been too heavily altered over time (it must have integrity) and still resemble a work of the "master." You must then determine if the work is truly a *significant* representation of the individual or firm's work. The work must, according to *National Register Bulletin 15*, "…express a particular phase in the development of the master's career, an aspect of his or her work, or a particular idea or theme in his or her craft" (Andrus and Shrimpton 2002:20).

Keep in mind that not all buildings by important engineers and architects are alike. For example, you might survey an Air Force classroom building from the 1960s that was designed by SOM, one of the most important design firms of the 1960s. SOM's important architectural works of the 1960s would need to be studied to determine what characteristics these buildings had. You may well find that these characteristics are not present in the building you are surveying, and that even though it was designed by SOM, the building is not as visually interesting or exciting as the firm's other work from that era. If you get the sense that the building is not a good example of what the designer or firm was known for, or if the building does not seem like a very creative expression of their work, or if the design was not well

thought out, then the building is probably not eligible as the work of a master. Again, the main point is that the work must be a *significant* example of the work of the master, one that represents or conveys something about the features that made their work distinctive or innovative.

3. Possesses high artistic value

For this concept, the property has to be a truly outstanding example of some type of design, planning, or artistic accomplishment. The property cannot be a typical example of its architectural, engineering, or artistic type or style; it must embody the characteristics of its type or style better than most other examples of the style or type (Andrus and Shrimpton 2002:20). Thus, this standard requires that a property be a truly outstanding example of whatever it is—if the property is not a near-perfect illustration of its particular architectural style or type of construction, then it is likely not eligible under this particular part of Criterion C, although it could be eligible under one of the other areas of Criterion C, especially the concept of "embody the distinctive characteristics of a type, period, or method of construction" (Andrus and Shrimpton 2002:18).

For example, if you find a Brutalist administrative building at an Army base, and research shows that it was designed by one of the great architects of that movement, *and* it is an outstanding example of Brutalism that perfectly illustrates the principles of Brutalism better than nearly any other building of the style, then it is a candidate to be eligible under the Criterion C concept of high artistic value.

Since high artistic value applies only to the very best examples of a particular style or movement, it will apply only for a small minority of DoD buildings. In addition, because of the prominent architectural status of these kinds of buildings, it is likely that many DoD buildings of this type have already been surveyed. Again, in general, it is much easier to prove that a building "embodies the distinctive characteristics of type, period, or method of construction" than it is to prove that it possesses high artistic value (Andrus and Shrimpton 2002:18–20).

4. Represent a significant and distinguishable entity whose components may lack individual distinction

This concept applies to historic districts rather than individual buildings. See page 90 for a discussion of landscapes and historic districts.

The Principle of Integrity

Introduction

The idea behind integrity is that a property (specifically, a building or perhaps a district composed of a group of buildings and related site elements or landscape features) has a certain aspect or quality that is significant. That quality of significance is some type of architectural or engineering distinction, whether it is a representation of an important style or type of construction, a significant work by an important architect, engineer, or firm, or some other type of significance related to engineering or architecture.

But it is not enough for the property to be significant; it must also retain the physical features that are associated with what makes the property significant. In other words, a property cannot have changed so much that it no longer resembles what it used to be. For example, if a building is significant as an example of the Art Deco style of the 1920s, the building would need to retain a significant amount of Art Deco features, enough that it still looks like something that was built in the 1920s. A viewer looking at the building who is familiar with the Art Deco style should be able to readily identify the building as such. If the building has been changed too much, whether by exterior alterations, additions, interior remodeling, or relocation, then it cannot convey a sense of what it is significant for, and therefore would not be eligible for the National Register (Andrus and Shrimpton 2002:44–45).

The National Register guidelines mention seven aspects of integrity that can be used to measure the integrity of a property: location, design, setting, materials, workmanship, feeling, and association. To be eligible, the property must have several of the aspects of integrity, although it need not have all seven. Determining which of the seven aspects of integrity are most important for a given property depends on what the property is significant for, which varies between properties.

Generally, when considering the architectural or engineering merit of a building under Criterion C, the setting and location of a building are important, but the aspects of integrity that are most critical to the overall integrity of the building are those specifically associated with the building itself, especially design, materials, and workmanship. This is because for Criterion C, it is the building itself that carries the associations that are important. In contrast, for example, for a farmhouse that is significant under Criterion A for agricultural history, the surrounding farm landscape and the rural setting of the house may be just as important to the integrity of the property as the preservation of the original features of the house itself. While integrity of setting gives Criterion C properties a stronger sense of overall integrity, it is the physical characteristics of the building—form, proportions, exterior materials and finishes, and also in some cases interior layout and finishes—that give the building its sense of integrity under Criterion C. Note, however, that if a building was eligible as part of a district, the intactness of the site features and overall landscape of the district would be a more important consideration, and integrity of setting would play a more important role.

National Register Bulletin 15 states that "A property significant under Criterion C must retain those physical features that characterize the type, period, or method of construction that the property represents. Retention of design, workmanship, and materials will usually be more important than location, setting, feeling, and association. Location and setting will be important, however, for those properties whose design is a reflection of their immediate environment such as designed landscapes and bridges" (Andrus and Shrimpton 2002:48). As mentioned above, the setting as embodied in site features and landscaping will be a more important consideration for buildings that are significant as part of a historic district.

As noted earlier in this report, many Modernist buildings lack ornamental details and do not have obviously handcrafted elements, since they tend to have a very precise machine-made aesthetic that is often fairly plain. The handcrafted elements often associated with integrity of workmanship—such as woodcarvings, ornamental plaster, sculpted stone or terra-cotta details, elaborate wood moldings, casework, or other intricate carpentry—may not apply to many Modernist buildings. Therefore, integrity of design and materials are the two most important integrity aspects for many Modernist buildings dating to the 1950–1975 era.

The Seven Aspects of Integrity

The following section contains a review of the seven aspects of integrity and discusses specific issues associated with Criterion C and architectural Modernism.

Location

"Location is the place where the historic property was constructed or where the historic event occurred" (Andrus and Shrimpton 2002:44).

For properties significant under Criterion C, location is the original place where the building was constructed. This aspect is important because the location and setting of a property often help the property to convey associations with historical events or information about the original function of the property. Although the National Register guidelines indicate that location is particularly important for buildings associated with historical events or persons, which is generally covered under National Register Criterion A and Criterion B (Andrus and Shrimpton 2002:44), it does not mean that location is not important for Criterion C properties.

Location can definitely add to the significance of a property that is significant under Criterion C, and while in some cases, a property could be relocated and still retain many of the features that make it significant, in other cases, the setting of the property conveys something essential about its design or engineering techniques. For example, Fallingwater, the well-known house designed by Frank Lloyd Wright near Bear Run, Pennsylvania, was built over a stream, and the choice of this site and how the landscape interacts with the house is a very important aspect of its architectural design. If Fallingwater were moved to another site, even if each part of the building was carefully moved and then reconstructed at another site, this sense of how the building was designed for the site and integrated into the landscape would be lost. For the work of Frank Lloyd Wright, sensitivity to the site is often one of the most important considerations, so if the original site-building relationship is lost, a critical element of the building's integrity has been destroyed.

A building may also have been built to fit a particular space or designed to fit into a hillside or other geographical feature. A building may have been built with a plaza around it, with the plaza being an important part of the overall design. If the building were moved to another site, it would no longer be located on the plaza, and once again, a significant feature of the building's integrity would be lost. Site features are also especially important for buildings whose significance is related to their role as parts of historic districts.

It is, however, possible to relocate a property that is significant under Criterion C from its original setting to one that is suitable for the property and similar to the original setting. If the property retains its significant architectural or engineering characteristics after being moved, then it might still be eligible in this type of case. Note that such situations would need to be analyzed carefully, as the loss of original location is always a serious loss of integrity (Andrus and Shrimpton 2002:44). It is usually best that a historic property remain in its original location, if at all possible.

When considering buildings that are important for association with historic districts, integrity of location is more critical. In a district, the inter-relationship between buildings, and the landscape and site design features around the buildings, must be given strong consideration.

Design

"Design is the combination of elements that create the form, plan, space, structure, and style of a property" (Andrus and Shrimpton 2002:44).

Design is one of the two most important aspects of integrity for Criterion C properties (the other is materials) and is one of the aspects of integrity that must be present for a Modernist property of the 1950–1975 years to be eligible for the National Register under Criterion C. This aspect measures how well the original overall features of the building have been retained. Design can relate to the overall form, massing, and shape of the building; whether original exterior and interior features have been retained; and whether site features such as landscaping or paved areas constructed as part of the building have been retained. This aspect measures whether the overall design of the property is still readily visible, or whether so many changes have occurred that the significant design features are no longer obvious to the viewer. Changes that can alter the sense of design are many, and include:

- Removal or covering up of important exterior architectural features
- Other exterior remodeling, such as adding inappropriate traditional features like columned porches, or adding a gabled or hipped roof to a building that originally had a flat roof
- Interior remodeling that covers up original features, destroys original features, or changes the floor plan extensively
- Large additions that change the overall proportions of the building, or an addition whose large size overpowers the sense of scale of the original building
- Destruction of a plaza, park, or other open space or landscaping that is essential to the design of the building's exterior; this type of change is especially important for buildings significant as part of historic districts that contain multiple features or buildings

While aspects of integrity like setting, location, materials, and workmanship focus more on one specific area of the property's integrity, integrity of design asks you to consider the building as a whole and to judge whether the property in its entirety still retains a sense of what is important about that property's design. Integrity of design is almost always crucial for a Criterion C property. For an architecturally significant property to be eligible for the National Register, it must be able to convey a sense of the property's original design; otherwise, it does not have the integrity needed to be eligible under Criterion C.

Site features and landscape are also especially important considerations for integrity of design, particularly if the building was designed with very prominent landscape or site features as essential elements of its design, or if the property is significant as part of a multi-element historic district that includes multiple features, such as more than one building and landscape and site elements. It is unlikely that the overall design of a multi-building district will retain integrity if the elements of site planning and layout have been radically changed, or if too many large new buildings have been constructed in the district, since this action erodes the original spatial relationship between the buildings and the surrounding landscape.

Setting

"Setting is the physical environment of a historic property" (Andrus and Shrimpton 2002:45).

Setting refers to the environment around the property rather than the physical location of the property itself; integrity of location refers to where the property sits, but integrity of setting involves a sense of the environment around the property. Aspects of the setting can be natural features like hills, valleys, wooded areas, or outcroppings of rock, or it can be features created by humans, such as lawns, streets, groups of buildings, or fences. This aspect is concerned with whether the area around the building has changed. In general, it is quite possible for the setting of a building to have changed significantly while the building itself has changed very little. The cityscape surrounding a 1950s Miesian glass box tower may have changed because nearby buildings have been demolished or reconstructed, but if the tower still retains its Miesian features, it will still be able to convey a sense of what Miesian architecture of the 1950s is like.

On the other hand, a corporate headquarters building constructed as part of a campus with a large open space around the building might no longer be eligible if that open space has been filled with new buildings. This is especially true if that open space was one of the critical design features that made the building significant or innovative. The intactness of the setting is also a very critical issue when evaluating buildings for their role in historic districts.

You must use your judgment when assessing what alterations to setting might be extensive enough to erode the integrity of a single building or a district. Since the functions of DoD facilities evolve over time, it is very common for complexes of buildings from the 1950–1975 years to contain post-1975 buildings or site elements. For example, the United States Air Force Academy's Cadet Area is designated as a National Historic Landmark, the highest level of historic designation conferred by the National Park Service. Some new buildings and building additions have been constructed at the Cadet Area complex in the past 45 years, diminishing the integrity of the complex somewhat. However, the complex retains its original buildings and most of the original landscape and site planning features, including the original plaza that formed the center of the campus. So while there have been some changes, the overall Cadet Area complex is still mostly intact and still has enough integrity of setting to qualify as a historic district.

However, there are actions that might have prevented the Cadet Area from qualifying as a historic district, if larger amounts of new construction were allowed within the area. For example, a large complex of buildings could have been built at the center of the Cadet Area in the 1980s, obliterating the central plaza and changing the spatial relationship between campus buildings. Had this been done, National Park Service officials might have concluded that the integrity of setting had been too heavily altered to designate the Cadet Area as a historic district. In the end, setting must be considered for every building and historic district, and some decision must be made in terms of how important a factor the setting is for the architectural character of a particular building or historic district.

Materials

"Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property" (Andrus and Shrimpton 2002:45).

Materials are the substances out of which a Modernist building is made. Having the original materials of the building still in place is very important for establishing the building as an authentic product of the time and place in which it was designed and built. Along with the aspect of design, this aspect of integrity is critical under Criterion C, especially for Modernist buildings. Without materials visible that date from the time and place of the building's design and construction, the building might look more like something that was built at a later time period. For building renovations, "the historic materials and significant features must have been preserved," and "the property must also be an actual historic resource, not a recreation; a recent structure fabricated to look historic is not eligible" (Andrus and Shrimpton 2002:45). Some reconstructed properties can be eligible under certain circumstances, however.

For Modernist buildings, the materials that are important for establishing the integrity of a building are structural materials like steel and reinforced concrete, plus cladding materials, which can include glass, metals, brick, concrete block, and precast concrete units. Interior structural materials such as steel, reinforced concrete, or laminated wood beams are often exposed. Other interior finishes like plaster, wallboard, metalwork, wood wall veneers, tile, or original ceiling tiles can also be important materials.

Problematic issues with materials and Modernist buildings often center on common alterations to certain materials. Interior remodeling is common, and many buildings have had alterations to the floor plan, as well as other types of remodeling. To some viewers, Modernist buildings have a hard-edged, geometric, machine-made, industrial look that can seem to lack warmth, and you may find buildings where the original materials have been replaced with traditional wood molding and trim, wallpaper, leaded glass, and other similar features to soften the look of the building and give the interior of the building a more traditional ambience. These activities tend to destroy or obscure the original finishes that give the building its sense of being a product of a particular time and place.

On the exteriors of buildings, steel and reinforced-concrete structure and brick masonry often survive, since these materials are fairly permanent and structural in nature. The material that is less likely to survive is glass. Modernist buildings often have an exterior of a steel or reinforced-concrete skeleton, with the spaces between filled in with large windows that usually have metal frames. Other Modernist buildings are composed on the exterior almost completely of glass curtain walls, so the entire exterior is a skin of glass panels, usually mounted in thin metal frames. Either way, the glass is a very important component of the exterior of the building. Because glass is particularly fragile, and metal window frames tend to bend and corrode over time, the exterior glass on Modernist buildings has often been replaced.

Window replacement is common for buildings dating from 1950–1975, and if the new windows were installed ca. 1980–2000, chances are very good that the replacement windows are not similar to the original ones. The 1950s–1970s military buildings were, in most cases, not considered to have historic significance during the 1980s and 1990s, since they had not reached the fifty-year mark yet. For many Modernist buildings, it is a major exterior change if the original type and finish of glass and the design of the original metal window frames are

replaced with a different type of glass or window frame. Such replacements can lead to a severe loss of integrity of materials for the building. Installation of inappropriate windows or glass curtain wall material can also affect the integrity of design for the building, since the proportions and visual configuration of the new window frames might be quite different from what the building originally had.

The doors of a Modernist building do not usually involve as much of the building's exterior surface area as do the windows (except in the case of certain types of aircraft hangars that have unusually large doors that include glass). However, be aware that replacing original doors with inappropriate units can also diminish the material integrity of a Modernist building, especially if the doors were a prominent element in the original design.

Workmanship

"Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory" (Andrus and Shrimpton 2002:45).

This aspect is somewhat more difficult for many Modernist buildings. Workmanship often refers to handcrafted work, such as handmade mortise-and-tenon carpentry work on a timber-frame building, or the wood carving, stone carving, or cast terra-cotta work that might be present on a late-nineteenth-century building with a large amount of ornament. Interior workmanship might include handmade plaster details, intricate carpentry, woodcarving, inlaid wood floors, detailed metalwork, murals, leaded glass, or other handcrafted elements.

The issue with many Modernist buildings is that the Modernist movement was a reaction against ornament, details, and construction elements that have a handmade look. Many Modernist buildings contain little or no ornament, as many of the Modernist designers were pursuing a machine-made aesthetic where everything about the building was uniform and precise. For this type of aesthetic, features with the irregularities and subtle variations of handcrafted items were considered undesirable. Thus handcrafted and ornamental details were decidedly not important considerations for many Modernist designers.

However, a sense of workmanship is still very evident in Modernist buildings. Often, the installation of brickwork, metal window frames, tile, or other details has been executed in a highly precise and regular fashion to conform to the Modernist machine aesthetic. The installation of building elements in this way can require a fairly high level of consistency and precision, which can be considered a type of workmanship. In addition, poured concrete may show evidence of craftsmanship, depending on how a building was constructed. Sometimes the concrete was poured quickly and was not executed with a great deal of craftsmanship; in such cases, the concrete is likely marked by uneven textures and sloppy, poorly defined edges. In other cases, the character and finish of the poured concrete may reflect a high level of skill. Some buildings of the early 1950s show lingering influences of the 1930s–1940s Art Moderne style, and these buildings may have well-crafted, smoothly finished, concrete exterior walls that may contain precisely defined elements like grooves, semicircular curves, or recessed panels that required some skill to execute competently. These types of concrete details and finishes may show evidence of highly skilled workmanship and may add to a building's significance under Criterion C.

In contrast, buildings associated with the 1960s–1970s Brutalist Movement may have concrete that has been given an especially rough-textured finish with tools (such as pneumatic air hammers), or the wood grain pattern of the concrete forms may have been carefully arranged to give the concrete a sense of texture. If executed with a high level of skill, rough-textured poured-concrete associated with both of these movements could be seen as an element reflecting integrity of workmanship, if the texture of the concrete is an important element in the Brutalist design of the building.

Some Modernist buildings do include primarily decorative features like mosaic tile or metalwork that did require a high level of skill to craft, but in general, workmanship is probably not as important for Modernist buildings as it is for pre-World War II American buildings that were designed and executed in an architectural style or approach where more work was done by hand or where handmade ornament was more common. Nonetheless, this area of integrity can be applied to Modernist buildings to reflect the precision and skill involved in producing high-quality work with materials like poured concrete, brick or concrete block masonry, glass, and steel.

Feeling

"Feeling is the property's expression of the aesthetic or historic sense of a particular period of time" (Andrus and Shrimpton 2002:45).

This aspect of integrity refers to the overall character of the property. In other words if a Modernist building from the early 1960s is in its original location and has sufficient integrity of design, setting, materials, and workmanship, the building should be able to convey a sense (a feeling) that it is from a different time period than our own; and a sense that the building originated in the early 1960s. Buildings from the past have a different appearance than buildings from our own time period, because we design things differently today, and we use different building materials and construction technologies that belong to our own era. A building can convey a visual sense of belonging to the past, as long as it has not been too heavily changed and updated in recent years. When a building has been recently updated in a way that removes or obscures the essential features of the property, it may look more like a product of a later time period. A building's appearance of belonging to the past and of not being from our own time period adds to the diversity of our visual environment and provides more variety, as well as reminding us of the past.

An observant viewer unfamiliar with the architecture of the early 1960s might notice that an early 1960s building is different somehow from the buildings of today. A viewer who is very familiar with the architecture of the 1960s should be able to readily recognize that same property as a product of the United States in the early 1960s, and as a building associated with one or more of the movements of American Modernism of that time. A building that has had too many changes will not have integrity of feeling, because someone with familiarity with the architecture of that time period will notice that the materials, scale, and proportions of the buildings are not consistent with the architecture of that time.

This aspect of integrity is somewhat more subjective than the other aspects. One can measure, and even possibly quantify, what percentage of the exterior materials of a building have been replaced, how intact the original design of the building is, or what percentage of the property's setting is intact. One can also determine whether the property has been relocated,

a fairly yes-or-no issue. But the sense of integrity of feeling is an overall judgment of how well the property as a whole can convey a sense of the time in history in which it was created, and the visual character of the architectural or engineering style or movement that it is associated with.

Association

"Association is the direct link between an important historic event or person and a historic property" (Andrus and Shrimpton 2002:45).

The aspect of association is similar to feeling but is geared toward the property's ability to visually convey a sense of association with a specific historical event or with a significant person; the overall idea is similar, in that a property must retain enough features associated with the original or significant time period from which it came, so that a viewer can mentally associate the property with that event or person. Like feeling, this aspect of integrity is more of an overall assessment of the property and is more subjective than more readily quantifiable areas of integrity such as location, design, setting, materials, and workmanship. Integrity of association is more relevant to significance under Criteria A and B than it is to Criterion C. For a Criterion C property, it is not necessary to mentally associate the building with an external historical event or person, because the form and design of the building itself embody the architectural style or movement that it represents.

Assessment of Integrity

The *National Register Bulletin 15* sets out the following steps for assessing integrity (all quotes below are from Andrus and Shrimpton 2002:45). Each step is followed by a discussion on how to apply the steps to Modernist architecture.

1. "Define the essential physical features that must be present for a property to retain its significance." First examine which features of the building make it significant. In the case of a building that represents a particular movement within Modernism, you need to study the particular architectural movement the building is related to, research what the most important characteristics of that style or movement are, and then determine if your building has them. The characteristics will be different, depending on what your building is associated with. For some buildings, the original interior layout might be the most important thing, while for others, it might be retention or exposure of the original structural system of the facility, or retention of the original exterior glass. Certain essential features might be associated specifically with particular architects or engineers; for example, the relationship between site and building might be an essential feature for a Frank Lloyd Wright building. Survival of certain structural features of a building might be essential if the building has significance in engineering. More information on essential physical features is provided beginning on page 83, and in the Evaluation Guidelines section beginning on page 95.

2. "Define whether the essential physical features are visible enough to convey their significance." Although the essential features of a Modernist building may still exist, they might be covered up on the exterior of the building by plywood, vinyl, or some other material that was added within the last few decades. Or, on the interior of the building, these features may be covered over with relatively recent gypsum wall board, plywood paneling, or acoustical tile drop ceilings. The essential features must be visible in order to convey a sense of the

property's significance and the time and place with which it is associated. Even if the features are intact, if they are covered up and not visible due to later modifications to the building, then the integrity of the building is questionable. Some less-essential portions of the exterior can be covered with newer materials, however, as long as the important form, features, and detailing of the building are still visible. It is not an integrity problem if significant features are covered by original features of the building, such as a steel frame tower where the steel beams and posts are covered over by glass exterior curtain walls. In this case, it is acceptable for the frame to be covered, since that is how the building was originally designed.

3. "Determine whether the property needs to be compared with similar properties." If more than one example exists of the type or style you are evaluating, in general, it is a good idea to compare the building with other similar buildings to see how its integrity level compares with others. This is especially true if the property you are assessing has been altered, and there is no scholarly information available to tell you what the original features were for this property type. For Modernist properties, this may not be as likely to happen since these buildings were built relatively recently (1950–1975), and the original features of the properties were often documented through old photographs available in the military base newsletters or architectural journals, or held in the collections of military base History or Public Affairs Offices. Original construction drawings, which have been retained for many of the buildings you will be dealing with, can also show the overall form and appearance of original features of a specific building. Do be aware that sometimes builders deviated from the original drawings during construction; sometimes these changes are documented on the construction drawings that survive, but not always. Therefore, it is always good to compare construction drawings carefully with archival photographs of the building, if possible, to get a clear picture of the building's original character.

4. "Determine, based on the significance and essential features, which aspects of integrity are particularly vital to the property being nominated and see if they are present." For Modernist buildings being evaluated for architectural or engineering significance under Criterion C, integrity of design and materials will be highly important in all cases. Integrity of location, setting and workmanship can also be important. A property with integrity of design and materials will therefore also likely have a good level of integrity of feeling for ca. 1950–1975 Modernism and possibly for one of the architectural movements of that era. This report has a separate discussion of which aspects of integrity are most important for Criterion C Modernist properties, starting on page 102.

Andrus and Shrimpton conclude their section on Integrity by stating, "Ultimately, the question of integrity is answered by whether or not the property retains the identity for which it is significant" (Andrus and Shrimpton 2002:45).

Essential Features

Buildings are not pieces of sculpture; because they are actively used by people, they change over time, as the building changes hands or its function changes. It is not necessary for a building to retain all of its historic physical features to be eligible for the National Register. If

this were true, only a tiny number of buildings that have undergone no changes at all would be eligible. However, *National Register Bulletin 15* (Andrus and Shrimpton 2002:46) states that for each property, there are essential features that must have been retained in order for the property to have integrity and be able to convey a sense of the significant place and time that it is associated with; without these features, a property could no longer be identified as a product of the place and time from which it came:

> A property important for illustrating a particular architectural style or construction technique must retain most of the physical features that constitute that style or technique. A property that has lost some historic materials or details can be eligible if it retains the majority of the features that illustrate the style in terms of the massing, spatial relationships, proportion, pattern of windows, and doors, texture of materials, and ornamentation. The property is not eligible, however, if it retains some basic features conveying massing but has lost the majority of features that once characterized its style (Andrus and Shrimpton 2002:46).

Bulletin 15 also provides guidance on assessing historic interiors in relation to essential features. For some buildings, it is the exterior that defines the building, and in such cases, the exterior of the building can convey a sense of its time and place without the viewer needing to access the interior. Steel-frame skyscrapers are specifically cited as a property type that would fall into this category, so it would appear that many Modernist buildings that are important for their exterior design could be eligible for the National Register even if the interior was heavily altered. However, some buildings are important for their interiors. A property whose primary architectural or engineering value was related to some aspect of the interior would likely not be eligible if that interior had been severely altered (Andrus and Shrimpton 2002:46). For example, a military auditorium with an unusually large open space that showed particularly good use of exposed structural steel would not be eligible if the open auditorium space had been divided into smaller spaces by the addition of new permanent walls.

Integrity Threshold for Significant but Rare Property Types

In general, a significant property must retain its essential features to be eligible under Criterion C. However, National Register guidance does suggest that a property that is an example of a significant but rare property type might still be eligible if it has a somewhat higher level of alteration than is usually acceptable, *if* the property is the best-preserved example of its type. This does not mean, of course, that the example of the rare property type can have an extremely low level of integrity and still be eligible; the essential features must still be present and visible for the building to be eligible (Andrus and Shrimpton 2002:47).

For example, suppose that in the 1950s, Skidmore, Owings & Merrill designed a series of glass-walled dining halls with open interiors that were highly significant architecturally for their use of glass curtain walls and structural steel to produce an unusually large open interior space. Suppose also that these mess halls are no longer practical for military use, and many of them have been demolished within the last thirty years. Of the fifteen mess halls designed by the firm in the 1950s, only one is left. This remaining mess hall could still be eligible for the National Register even if it had a moderate level of alteration, since it is the last example left of its type, and this building type is considered to be important. On the other hand, if all fifteen of the mess halls were still standing, then a building that has been altered at a moderate level might be considered not eligible, especially if relatively unaltered examples still remained.

The National Register Criteria Considerations

Introduction

In addition to the normal Criterion C that is used to evaluate a property's architectural or engineering merit, the National Park Service has seven sets of special requirements for certain specific types of properties that under the normal guidelines are typically considered ineligible for the National Register. These considerations are designated by letters (Criteria Considerations A–G) in a fashion similar to the letter designations for the National Register Criteria, so it is important not to confuse Criteria Considerations A–D with the regular National Register Criteria A–D. All of the criteria considerations are listed below, although several refer to property types that are not covered in this study and so are not likely to be applied (Andrus and Shrimpton 2002). The criteria considerations that more commonly apply to the type of properties covered by this document are discussed in more detail; those having a low potential for being invoked do not have individual breakout discussions.

- Criteria Consideration A, for religious properties.
  (low relevance for this document, as a separate DoD study is underway to specifically cover military chapels; discussed briefly below).
- Criteria Consideration B, for moved properties.
  (not common for the property types covered here; discussed briefly below)
- Criteria Consideration C, for birthplaces or graves.
  (low relevance, as this document is geared toward research, laboratory, training, recreational, medical, and administrative buildings, rather than cemeteries, mausoleums, or housing units; not discussed further).
- Criteria Consideration D, for cemeteries.
  (low relevance, as this document deals primarily with buildings, and it is fairly unlikely that military facilities like training buildings or laboratories will be associated with cemeteries that date from the time of their construction; not discussed further).
- Criteria Consideration E, for reconstructed properties.
  (not common for the property types covered here; discussed briefly below)
- Criteria Consideration F, for commemorative properties.
  (not common for the property types covered here; discussed briefly below).
- Criteria Consideration G, for properties under fifty years old or that have significance related to historical events of the past fifty years (high relevance, discussed below).

The criteria consideration that is most likely to apply to Modernist military buildings dating to 1950–1975 is Criteria Consideration G for properties that have achieved significance within the past fifty years. As of the date of the completion of this study (2012), properties dating to 1962 will be those just reaching the fifty-year threshold for eligibility. Any property less than fifty years old must be evaluated using both the regular National Register Criteria A–D *and* Criteria Consideration G for properties under fifty years old or properties that have achieved significance because of events that occurred during the past fifty years. Criteria Consideration G requires resources less than fifty years old to have a higher level of importance than properties that are over fifty, so it sets a higher standard for evaluation. Because of this distinction in the evaluation criteria, determining whether the building has reached or is past the fifty-year mark is an important consideration.

If a building is within five years of being fifty years old, a situation can arise where a building is evaluated under Criterion C and Criteria Consideration G, but then this same building would need to be resurveyed a few years later once it turns fifty, under Criterion C only, without application of Criteria Consideration G. To avoid the duplication of effort inherent in this situation, some government agencies instruct surveyors to treat any building that is within five years of being fifty years old (any building 45 years or older) as if it has reached the fifty-year mark. If this policy were to be applied today (2012), a 45-year limit would put the cutoff mark for Criteria Consideration G at 1967. In such cases, any property dating to 1967 or before would not need to be evaluated using Criteria Consideration G, and any property built in 1968 or later would also need to be evaluated under Criteria Consideration G.

The criteria considerations relevant to this context are discussed below in the order of their letter designation. Some are less relevant and merit only brief discussion, while others such as Criteria Consideration G are discussed more extensively.

Criteria Consideration A: Religious Properties

Criteria Consideration A is for religious properties and, in general, not highly relevant for this document, as the subject is evaluating military buildings rather than private-sector churches. A separate context study on military chapels is currently underway for the DoD, and so this document does not focus extensively on that property type. However, there are some instances where you might need to deal with military chapels as part of a historic district, so some discussion of this criteria consideration is included here. Criteria Consideration A states that religious properties cannot be eligible for the National Register based on the merits of the religious doctrine it is associated with. The religious property can be eligible under Criterion C if it is significant for artistic, architectural, or engineering merit, or under Criterion A if the property is associated with a social or ethnic group that had a high level of significance in the overall history of a city or region.

Under Criterion C, a military chapel could certainly be eligible individually for its own engineering or architectural merit. A chapel could also be contributing to a military historic district under Criterion C as long as the chapel is significant for its architectural contribution to the district, and is not being considered significant solely because of its role as a place of religious worship. For example, the Air Force Academy Chapel, designed by Walter Netsch of Skidmore, Owings & Merrill, is a contributing property in the Cadet Area Historic District of the U.S. Air Force Academy. It is contributing not because it is a place of religious worship but because it is an important Modernist building, and because it is an integral building in the architecturally significant Cadet Area of the academy.

Criteria Consideration B: Moved Properties

Many of the major hospitals, administrative, training, laboratory, and educational military buildings that would be evaluated under this context are probably too large to have been relocated. However, some smaller buildings that have Modernist architectural merit may have been moved at some point. The National Park Service considers relocation to be a serious loss of integrity, as "…significance is embodied in locations and settings as well as in the properties themselves. Moving a property destroys the relationships between the property and its surroundings and destroys associations with historic events and persons. A move may also

cause the loss of historic features such as landscaping, foundations, and chimneys, as well as loss of the potential for associated archaeological deposits" (Andrus and Shrimpton 2002:29).

Park Service guidance does state that in the case of properties that are eligible for their architectural value, "A moved property significant under Criterion C must retain enough historic features to convey its architectural values and retain integrity of design, materials, workmanship, feeling, and association" (Andrus and Shrimpton 2002:29). In other words, a work of architectural Modernism that is significant under Criterion C could be eligible if it were moved, as long as the building retains the original essential features that give it integrity under the other six aspects of integrity.

An example of such a case might be a small Modernist military training building that is significant for the interior design of the building. In this instance, the surrounding site and landscaping would not be especially essential to the significance of the building's interior. If this building were moved to another location, the building would still retain the Modernist interior layout and finishes that make the building architecturally significant. In this kind of example, you could argue that the building still retains its essential features and could still be eligible for the National Register under Criterion C.

Obviously, in the case of a building where the site, surrounding landscaping, or the building's relationship with other nearby buildings are an important part of the building's integrity of design, then the building would likely not be eligible once it was removed from its original setting. Each case must be considered individually, as other properties might not depend as heavily on setting for their Criterion C significance, and relocation might not exclude them from eligibility.

Criteria Consideration E: Reconstructed Properties

This criteria consideration would probably not come into play very often for Modernist military buildings dating to ca. 1950–1975 that are being considered for architectural or engineering merit. Most reconstructions are associated with older buildings that are considered to have a very high level of historic merit. However, it is possible that a destroyed Modernist building from these years might be reconstructed, or that a Modernist building from this era that survives in only a very fragmentary way might at some point be reconstructed with a mixture of new materials and whatever fragmentary materials remain from the original building. In both cases, Criteria Consideration E would need to be applied.

The main areas where reconstructed properties are considered acceptable for National Register eligibility are cases where the reconstruction is part of an otherwise intact group of historic buildings that has a high level of integrity. Also, once the reconstruction is over fifty years old, it may be considered on its own historical merit; in other words, the act of reconstructing the property could be analyzed to see if this action was historically significant in itself. Both likelihoods are not all that likely for military buildings of the 1950–1975 years, but it is useful to know that this criteria consideration exists, and there might be certain rare situations where it would apply.

Criteria Consideration F: Commemorative Properties

Criteria Consideration F would probably not come be commonly applied to Modernist military buildings dating to ca. 1950–1975 that are being considered for architectural or engineering merit. This criteria consideration is for properties that commemorate a specific person or event significant in history, and these properties have been constructed after the event, so they are not directly associated with the event, or with the productive portion of the life of the historically significant person. The criteria consideration states that these properties must have significance in their own right; they are not significant because of associations with the event they commemorate (Andrus and Shrimpton 2002:39).

Thus, a 1950s Air Force monument commemorating U.S. Army Air Forces General Jimmy Doolittle for his famous 1942 bombing raid over Tokyo would not be significant for associations with General Doolittle himself. However, if historians determined that the commemoration of significant World War II airmen in the 1950s was in itself an important historical trend or event, then the monument would be significant for its associations with the 1950s-era military commemorations.

The reason that this consideration would not apply to most DoD Modernist buildings dating to 1950–1975 is that for the consideration to apply, the building must have commemoration as its primary purpose. A mess hall might be named after World War II Admiral Chester E. Nimitz, and might contain a commemorative display on Nimitz on the interior of the building. However, if the primary function of the building is as a mess hall, then Criteria Consideration F would not apply because the primary function of the building is to serve as a dining facility, not as a memorial to Nimitz.

Furthermore, since this study is focused on architectural and engineering merit, Criteria Consideration F should not prevent a commemorative building constructed from 1950–1975 from being eligible for the National Register under Criterion C if the commemorative building is significant due to its own architectural or engineering merit (Andrus and Shrimpton 2002:39–40).

It is possible that a commemorative monument might be part of a significant ensemble of buildings and landscape features that were built as part of the construction of a new military base or a new training, administrative, or research campus at an existing base, during the 1950–1975 years. As long as the monument or other commemorative property adds to the design significance of the district, Criteria Consideration F does not prevent the commemorative property from being eligible for the National Register as a contributing property in the historic district under Criterion C.

As a hypothetical example, a memorial fountain completed in 1962 in the Cadet Area of the Air Force Academy might commemorate Air Force pilots who were lost in the Korean War of 1950–1953. Such a (hypothetical) fountain could not be eligible for the National Register under Criterion A for associations with the Korean War, and it would also not be eligible under Criterion B for its association with the pilots it commemorates. However, the fountain could be eligible under Criterion A if the act of commemorating the pilots was judged by historians to be a significant historical event of the 1960s. Furthermore, the fountain could also certainly be eligible under Criterion C as a contributing property in a Cadet Area Historic District, if the fountain were judged to be an important part of the architecturally significant site design of the Cadet Area.

Criteria Consideration G: Properties That Have Achieved Significance Within the Past Fifty Years

At the time of the completion of this study in 2012, this criteria consideration would apply to buildings dating to the 1963–1975 portion of the time period covered in this study. If a five-year buffer were applied to the fifty-year rule, then the facilities covered by this context that would be subject to Criteria Consideration G would date from 1968–1975. Either way, this includes a large number of DoD buildings.

If a property is less than fifty years old, it must have an exceptional level of importance to be eligible for the National Register. This means that either the resource is highly important for one reason or another, or it is part of a fragile class of resources that are rare because examples tend to disappear quickly.

Exceptional importance is the most common reason that Criteria Consideration G is applied to military buildings being evaluated under Criterion C. To be eligible under Criterion C and Criteria Consideration G, a building would need to be an unusually important example of architecture or engineering. The property could be one of the earliest or most important American representations of a particular Modernist architectural movement. The building might also have used a revolutionary technology that had a profound effect on the history of twentieth-century engineering or construction. The building could also be of exceptional importance as one of the finest works of a highly important architect, engineer, or design firm.

The judgment of whether something is exceptionally important is somewhat subjective. One technique would be to compare the building with other examples of its architectural style or movement, or of similar engineering technique, and determine whether the building in question is one of the best examples of that style, movement, or structural type.

The same could be said of architects and engineers. If the building was clearly designed by a highly important architect or engineer, is that building one of the finest examples of that person or firm's design work from that era? Although relatively few military buildings from the 1963–1975 years are likely to fall into that category, the military did hire prominent architects and innovative engineers and it is possible that such a property might be encountered during a building evaluation survey. Of course, the building must also meet the usual National Register standards for integrity; it must retain the important aspects of integrity for its property type and must have the appropriate essential features in order to have enough integrity to be eligible under Criterion C. Below are two hypothetical examples (these buildings do not actually exist):

- A 1972 Marine Corps recreational building by the firm of Alexander and Neutra. This hypothetical recreational building was designed by an architectural partnership that included the great American twentieth-century architect Richard Neutra at a Marine Corps installation in California. The building has a good level of exterior integrity; there have been some minor alterations, but most of the original exterior materials are present. However, research into the construction drawings of the building and other records of the Neutra & Alexander firm reveal that the building was not designed by Neutra himself but mostly by Neutra's partner, Robert Alexander. The design does not contain the architectural features that are considered most important for Modernist work at the beginning of the

1970s. The building is currently not at the fifty-year mark (or within five years of the fifty-year mark), so it is still subject to the exceptional importance requirements of Criteria Consideration G. Alexander is not considered to be a particularly important Modernist architect, and the building is not an outstanding example of early 1970s Modernism. The recreational building is not eligible under Criterion C and Criteria Consideration G. The building could be re-evaluated in 2020, once it has reached fifty-year mark, to see if it is eligible under the less rigorous standards of Criterion C, without the application of Criteria Consideration G.

- A 1969 Navy Laboratory building by Skidmore, Owings & Merrill. This hypothetical building, built at a Navy installation in Illinois, is found to be an outstanding example of SOM's late 1960s work; it is among the finest buildings designed by them during that time frame. The building won an American Institute of Architects awards, was published in architectural journals, and is still considered by architects today as one of the important SOM buildings of that period. The design of the building also influenced architects who were designing similar buildings during the early 1960s. The building has had some interior alterations, but the exterior is highly intact. This building would likely be eligible for the National Register under Criteria Consideration G with Criterion C since it is one of the best works of its era, it was designed by one of the most significant architectural firms of the time, and it had a major influence on the design of later buildings of its type.

ACHP Program Comments on Barracks and Magazines

When surveying barracks or ammunition storage facilities, it is important to keep in mind that the Advisory Council on Historic Preservation (ACHP) has created alternate procedures for dealing with these facilities; these procedures are somewhat different from the regular Section 110 and 106 processes that the guidance in this report is based on. These alternate procedures, known as program comments, apply to unaccompanied personnel housing (barracks) dating to 1946–1974, and ammunition storage facilities dating to 1939–1974. Please see Appendix C for copies of these two program comments.

The overall gist of the two program comments is that the military may alter or demolish the facilities covered under the program comments with no further Section 106 mitigation, unless the facilities are contributing properties in a historic district that is either listed in or eligible for the National Register.

Landscapes and Historic Districts

Introduction

The main emphasis of this guide is on evaluating individual buildings for National Register eligibility under Criterion C for engineering or architectural significance connected with Modernism. However, all military buildings are part of a larger landscape that may consist of a complex of buildings within an installation, or an entire installation. A building may be part of a landscape that was influenced by Modernism, and that includes features such as roads, plazas, lawns, plantings, fountains, monuments, retaining walls, and other elements that may

be related to the building. Some buildings also belong to multi-building complexes, and these groups of buildings, together with the site features that go along with them, could be eligible for the National Register as a historic district. In general, one must always also consider landscape and historic district issues when dealing with the Criterion C significance of buildings.

Landscape Features

Each building is located on a site that contains elements that form the physical context of the property. The design of the space around the building is part of the building's overall design and adds to the building's sense of integrity. Changes to the setting can affect the overall character of the building and may diminish integrity, depending on how important the setting is to the character of the building.

In the case of military buildings that are likely to have architectural significance under Criterion C, these settings will likely be concrete or asphalt paved areas or lawn areas within military installations. The immediate setting of a building may be complex or it may be simple. Several buildings at Wright-Patterson that were examined for this survey were built on grass lawns or asphalt lots within existing road layouts that were designed well before the construction of the building. The landscape features relevant to these buildings would be limited to lawn spaces or concrete or asphalt parking lots, and possibly concrete sidewalks. Many military buildings will have a simple setting like this, and the amount of landscape features that contribute to the property will be fairly minimal. It is also possible that the building will have minimal landscaping consisting of a sparse amount of trees or some type of shrubbery, often taking the form of foundation plantings. It is important to examine archival photographs, site plans, or original landscape planting plans, if available, to determine if these features are original to the building or if they were added at a much later time and are therefore not related to the original design of the structure.

In some cases, buildings will have fairly elaborate site features and plantings that may add to the architectural character of the building. For buildings dating to 1950–1975 and associated with Modernism, the following circumstances are worth noting:

- Some early 1950s buildings could be placed on formal stone or concrete-paved plazas as a holdover from Neoclassical influences as part of the tail end of the Stripped Classicism movement.
- Miesian buildings often face large open lawns or large concrete plazas. The plazas are often designed with square or rectangular forms that strengthen the grid-like geometrical character of the building. The Terrazzo (central plaza) at the Air Force Academy is a good example (see page 49), since it is designed in a series of square modules that are based on the same dimensions as the construction modules that were used to determine the size and proportions of the buildings.
- Buildings constructed in the 1960s and 1970s in connection with New Formalism may include paved and landscaped plazas, often located in front of the buildings. The plazas may contain a central element like a fountain or monument, since New Formalism has an emphasis on symmetry. These plazas are important to these facilities and should be considered when evaluating overall integrity, especially in the areas of integrity of

design and setting. Plazas often form part of the symmetrical composition of a New Formalist building and are part of the overall sense of Classical symmetry for these structures.

- Plazas for Brutalist buildings are also common, most often in the front of the building. These plazas are sometimes less symmetrical than ones for New Formalist buildings, and they often contain the same rough concrete textures as the building, functioning as an extension of the building itself. These plazas are an important consideration in assessing the integrity of design and setting for these buildings.
- Buildings constructed at the end of the 1960s or the early 1970s are often accompanied by areas where earth has been shaped or mounded up as part of the design. This trend may have been viewed as environmentally friendly, as the earth helped to insulate portions of the building and blend it into the surrounding landscape. These earth features may be important site features for buildings constructed during this time frame.
- Heavy tree plantings were also used in the late 1960s and early 1970s, also apparently in the interest of blending the buildings into the landscape.

Historic Districts

Groups of buildings constructed at the same time during the 1950–1975 years may be eligible under Criterion C as historic districts. It may be that a series of buildings that would not be individually eligible for their architectural or engineering merit may be eligible together as a group; the buildings themselves may be eligible under Criterion C for architectural design as an ensemble. It is possible that a historic district associated with Modernism at a military installation might be composed of a series of significant buildings that were built at different times and even reflect different architectural movements, but that together form an ensemble of buildings that perhaps represents the evolution of military design, or that reflects the work of several architects or firms that were significant in military design or the architecture of a specific region.

Districts have a series of concerns that are different from those associated with individual buildings. With a district, the integrity of setting and design are highly important, in terms of what has been done with the areas surrounding the buildings. Areas where too much new construction has been fitted into an existing layout may not be eligible, as the new construction may have changed the layout too much and may have altered the spatial relationship between the buildings. Such alterations have to be considered case by case, and the cumulative alterations to a campus of buildings over time should be considered. Depending on the size of the district, some new buildings, the loss of original landscape features, or the construction of additions to original buildings may be acceptable. Most military campuses and growing and evolving properties must be updated and added to in order to remain functional. Even the U.S. Air Force Academy Cadet Area by Skidmore, Owings & Merrill, which is designated as a National Historic Landmark, has had several buildings added to the campus after its initial completion in 1962, and several of the contributing buildings have been altered or have additions. The district does not have to be in a pristine, unaltered condition to be eligible—some level of alteration is acceptable, as long as the original form and layout of the district, including its landscape, is mostly intact.

Discussed below are several hypothetical examples of how a campus-like group of military buildings may have been altered in terms of the overall historic district landscape of the properties:

- The original buildings of an Air Force training campus were constructed on a grid as part of a Miesian layout, but several new buildings have now been put in at a diagonal angle, transforming the geometry of the campus layout. If the buildings are large and prominent, this may diminish the overall integrity of the district to the point where it no longer retains enough integrity for a historic district under Criterion C for Miesian campus design. The alteration to the district is not very reversible, as the new buildings are of permanent construction.
- An Air Force technology campus was designed with a large central building and about five smaller classroom buildings as part of the original construction, with an informal layout reminiscent of the work of Modernist designers Walter Gropius or Eero Saarinen. Four out of the five smaller buildings have been demolished and replaced with parking lots. The loss of these buildings and their replacement with open parking space has altered the spatial arrangement of the area, so it would likely not be eligible as a district. The remaining buildings could be evaluated for individual eligibility under Criterion C if they have a good level of integrity and are architecturally significant in their own right.
- In a proposed small historic district, the district's central plaza has been filled in with a large parking garage. If the open plaza was essential to the layout and plan of the district, it is likely that this area would not have enough integrity to be a historic district under Criterion C in connection with Modernism, since a central spatial feature of the ensemble has been destroyed and replaced with a large new element.
- A Modernist administrative campus at a Marine Corps installation may have originally been surrounded by a grass lawn, but perhaps portions of that lawn were destroyed in the 1980s in favor of expanded asphalt parking lots. The areas have been retained as relatively open space, but the landscape has been altered as areas of grass have been replaced by asphalt pavement that now holds automobiles. You would need to assess how important those greenspace areas are to the original design of the district, and whether their loss sufficiently diminishes integrity to eliminate the possibility of a district.
- A Navy campus that is being considered for a historic district originally had heavy plantings of trees. The original tree plantings from the 1950s have not been maintained, and new trees have not been planted as the old ones died. The original lawn spaces of the district and other open spaces have been maintained. In this case, the tree loss diminishes integrity, but since other elements are still in place, there might be enough integrity for the district to still be eligible. Since the open space was retained, it would also be possible to plant new trees that conform to the spirit of the property's original landscape plan to restore the district landscape to a state something closer to its original appearance. The loss of some trees would have diminished the character of the landscape, but this trend could be reversed, as long as open space has been maintained.

Overall, when considering whether a Modernist historic district is present, the integrity of the buildings themselves must be evaluated together with the integrity of the complex as a whole,

any significant landscape features, and the spatial relationship between the buildings and the landscape features.

Several prominent university and private-sector office and research campuses influenced the design of building complexes in the 1950s and 1960s. Additional information is included on this subject in the historic context in this report. The 1939 campus design of the Illinois Institute of Technology (IIT) by Mies was influential on building complex design of the 1950s and 1960s. Mies's design for IIT emphasizes symmetry and the placement of rectangular buildings at right angles on a grid. Lawn spaces are positioned in between the buildings. This grid-based approach can be seen in the design of military campuses such as the Recruit Training Command area at Naval Station Great Lakes, which was designed by Pace Associates in the mid-1950s.

Several other designs of building complexes that were influential in the 1950s and 1960s took an approach that was different than that of Mies at IIT. These campuses tended toward asymmetrical arrangements of buildings that were placed together in a tight composition, but with some lawn spaces around the buildings. One example is the 1949–1950 Harvard Graduate Center, designed by The Architects Collaborative, a firm founded by Modernist designer Walter Gropius. The graduate center plan has a series of long, narrow buildings spaced fairly closely together, with many of the buildings connected together by interior walkways. As opposed to a series of regularly spaced boxes on a grid, the buildings are arranged in something of a zig-zag pattern, with U-shaped arrangements of buildings enclosing courtyard-like lawn spaces. Most of the buildings are at right angles, although one building is placed at a diagonal. This complex and other similarly designed campus arrangements influenced the Air Force's mid-1950s campus at Hanscomb Air Force Base (Weitze 2003:233–240). The 1952 Naval Postgraduate School by Skidmore, Owings & Merrill also has a layout that reflects this overall type of design. This approach keeps all of the buildings fairly close together for convenience, while providing green space in between the buildings. The long narrow shape of the buildings and their placement with lawn spaces in between also allows for significant amounts of natural light inside the buildings. The appearance of these campuses is generally less formal than those based on more symmetrical grid-based models.

Additional guidance on historic landscape is available in *National Register Bulletin 18: How to Evaluate and Nominate Historic Designed Landscapes* (Keller and Keller 1988). The issue of 1950–1975 planning of building complexes is also discussed in much further detail in the section "1947–1954: Postwar Modernism in Military Architecture," beginning on page 36.

EVALUATION GUIDELINES

Introduction

This section lists the most important architectural movements that are common to the 1950–1975 period and had the greatest influence, and then describes the characteristics of each movement or style that you should look for when evaluating buildings. Also included are guidelines for applying the National Register rules of integrity to Modernist properties, with descriptions of the specific considerations and features that are relevant.

Important Movements and Their Characteristics

Earlier Movements

(Dominant in the 1950s and sometimes into the 1960s)

Early Modernism or Streamlined Modernism

(Most commonly appears ca. 1950–1955)

The streamlined Art Moderne style and the Stripped Classical style continued for several years after World War II, during the period in which Miesian design and other more up-to-date forms of Modernism were establishing themselves in the United States. The buildings of early Modernism contain features that were common before World War II: 1940s elements like ribbon windows, curved corners, and fairly plain buildings with traditional features such as modest Classical ornament or exterior cladding composed of traditional types of stone, especially smooth white limestone. Look for fairly solid-looking brick, stone veneer, or concrete walls, ribbon windows, and flat rooflines. This movement was already dying out by the beginning of the 1950s and does not appear much after about 1955, as Miesian design and other more current forms of Modernism took hold.

Important Features

- Walls are brick or concrete load-bearing, punctuated with steel multi-pane windows and glass block.
- Rooflines are flat.
- Cubic forms are used, and buildings are often square or rectangular box-like structures with low, horizontal proportions.
- Interiors tend to be divided up into traditional room spaces, although some use of the open floor plan can be seen.
- Long, horizontal bands of ribbon windows are common and may contain (or have originally contained) steel-sash industrial windows, glass block, or a combination of the two.
- Multi-building groups tend to be consistent in height and form to provide a sense of uniformity and unity.

- More high-style buildings typically show more creativity in the design of the geometrical forms, and details may be designed more carefully than less distinguished examples.
- Buildings that are less high-style and less creative in their design may exhibit flat rooflines and cubic form but have exteriors composed of brick or concrete walls with individual punched-in windows instead of ribbon windows.
- Important materials are reinforced concrete, brick, concrete block, steel, and aluminum.
- Types of windows commonly used are multi-pane steel-sash windows and glass block.

Miesian Movement (appears in DoD Buildings from the 1950s–mid 1960s)

In the 1950s and early 1960s, the Miesian approach to design was popular among American architects. Many buildings were cubic in form, and glass boxes were common. Miesian influences could be mixed in with other influences, especially European Modernism of the 1920s and 1930s, as well as the 1940s and 1950s works of important Modernist designers like Eero Saarinen. The earliest Miesian skyscraper in the United States was under construction in the late 1940s, and buildings like SOM/Bunshaft's Lever House (1951) helped propel the style into popularity in the early 1950s. Look for buildings with construction dates of ca. 1950–1964, although glass boxes continued to be designed by some architects well into the 1970s, especially office towers.

Important Features

- Glass curtain walls are used on the exterior.
- Rooflines are flat.
- Exposure of, or representation of, steel or reinforced-concrete frame on the exterior of the building.
- Cubic forms are used, and buildings are often square or rectangular box-like structures.
- Bottom floor of the building is often a recessed porch area with thin supports (pilotis) that make the upper floors of the building appear to be hovering above the ground.
- Sometimes a proportional module (such as an imaginary 7-foot cube) was used to determine sizes of buildings, the distances between buildings, and other proportions and dimensions of the design. The module gives the buildings or complex of buildings a sense of uniform proportion.
- Interiors are often open with movable partitions to allow for flexible use of the space.
- More high-style buildings typically show more creativity in the design of the geometrical forms, and details like the frames of metal windows may be designed and proportioned more carefully than less distinguished examples.
- Complexes of more than one building may be arranged in a grid pattern, with buildings positioned at right angles to each other. The layout of the buildings may be symmetrical or nearly symmetrical, and sizes of buildings and distances between buildings may be based on a proportional module. Spaces in between the buildings are often filled with plaza or lawn space.

- Buildings that are less high-style and less creative in their design may exhibit flat rooflines and cubic form but have exteriors composed of brick or concrete walls, with individual punched-in windows instead of large expanses of glass. The less distinguished buildings often have a sense of the walls of the building as a heavy solid element. Buildings that reflect a more advanced understanding of Miesian or International Style influence often attempt to give the building a sense of weightlessness, either through cantilevering a portion of the building out over empty space, by including a recessed porch on the first floor with thin-looking supports, or by designing the exterior of the building with a delicate framework of thin metal elements framing glass panels.
- Important materials are reinforced concrete, porcelain-coated steel panels, concrete block, steel, aluminum, and many different types of glass; brick was also used.

Other Modernism Movements in the 1950s–mid 1960s

Not all architects of the first half of the 1960s followed the Miesian approach. Designers like Marcel Breuer and Walter Gropius had been designing buildings in a less formal style in the 1940s in the United States. Their work was more varied in form than the Miesian buildings, and the overall shapes and compositions of their buildings tended to be less rigidly geometrical and, in some cases, more asymmetrical. Other architects that were influential were Eero Saarinen and Le Corbusier. Major influences were the 1940s and 1950s American buildings of Gropius, Breuer, and some other European designers who had escaped Europe during that period. Another possible set of influences is earlier European Modernism of the 1920s and 1930s.

This category does not really represent a unified style or movement but is provided here to account for the many 1950s and early 1960s Modernist buildings that would not be classified as Miesian, as a holdover of 1940s Art Moderne or Stripped Classicism, or as a representation of one of the later movements of post-World War II Modernism (Brutalism, New Formalism, Expressionism). This group of buildings varies widely and is based on a large number of influences, including the American work of Eero Saarinen, Marcel Breuer, and Walter Gropius, older International Style architecture of 1920s and 1930s Europe, and some European buildings of the late 1940s and early 1950s, especially works by Le Corbusier.

Important Features

- Exteriors often contained glass, steel, reinforced concrete, brick, or wood paneling.
- Rooflines are flat or shed.
- In some cases, horizontal bands of glass (ribbon windows) are used.
- Exposure of, or representation of, steel or reinforced-concrete structural frame on the exterior of the building.
- Cubic forms were often used, but the buildings were not always rectangular boxes; sometimes they had a more complex, irregular, asymmetrical form.
- Like Miesian buildings, sometimes the bottom floor of the building is a recessed porch area with thin supports (pilotis) that make the upper floors of the building appear to be hovering above the ground.

- The structure is sometimes shown on the exterior of the building, but some designers like Louis Kahn and Phillip Johnson obscured the structure of the building with exterior walls. Kahn liked to use brick for exterior walls; Johnson favored glass.
- Open interiors, but the interior design was often specially designed for the function to be contained within. This is in contrast to some Miesian buildings that were left open on the interior with movable partitions provided, with the idea that a building interior should be a somewhat generic large open space that was easily reconfigured to fit changing functions.
- Buildings are not always grouped together at right angles; sometime they are oriented diagonally or at a skewed angle, either for aesthetic effect or to take advantage of factors like sunlight. Site plans may include long, narrow, low-rise buildings arranged in an asymmetrical composition with landscaped areas in between the buildings.
- Important materials are reinforced concrete, concrete block, steel, aluminum, and many different types of glass. Brick is used more extensively in these buildings than it was in high-style Miesian design, and wood and stone exterior cladding can also be seen on some of these buildings.

Later Movements: Brutalism, New Formalism, and Expressionism

(Dominant mostly in DoD buildings of the 1960s and early 1970s)

These movements are more diverse visually and have fewer things in common with each other than the architecture of the 1950s and earlier 1960s. Surveyors should also keep in mind that buildings may be a mix of two or more of these trends, and the movements could have been blended in with influences from European Modernism or from the Miesian movement.

These movements originated in the 1950s, and it is possible that there might be 1950s examples of some of these movements in the United States. However, most of these movements caught on most strongly in the United States during the 1960s. Most DoD examples of these styles should date to the 1960s or early 1970s, especially in the case of Brutalism, which seems to have achieved traction in the United States after Paul Rudolph's Yale Fine Arts Building was completed in 1964.

Brutalism

(Most commonly appears in DoD buildings ca. 1964–1973)

The movement originated in England during the 1950s and was influenced strongly by the 1950s work of the French architect Le Corbusier. In the United States, the 1964 completion of the Yale Fine Arts Building by Paul Rudolph seems to have marked the beginning of the movement's major era of popularity. Brutalism reached a climax in the United States from about 1965–1970, and many Brutalist buildings were designed and built in the last half of the 1960s. The style's influence appears to have waned during the first half of the 1970s. Look for the influence of Brutalism especially in military buildings with a construction date of ca. 1964–1973.

Important Features

- Structural materials are exposed on the exterior and interior.
- On many buildings, exposed poured concrete is used that is often finished with a rough texture created by working the concrete with power tools (air hammers and such). In other cases, the roughness of the concrete is due to the lack of finishing of the concrete. If the concrete was not finished, the resulting texture was that of the grain of the plywood used to make the forms into which the concrete was poured.
- Most of these buildings tend to show massive, heavy forms with exposed poured-concrete and other rough textures. Brick or block masonry was also used in some cases.
- Rooflines are most often flat.
- The shapes and forms of the exteriors of the buildings are bold, with large boxy areas of concrete and large recessed areas that create deep, heavy shadows. Large boxy forms or concrete beams are often cantilevered on the exterior and appear to be jutting out into space with no support below.
- Forms are often cubic and boxlike, but the building is not usually one large cube; more commonly, it is composed of a series of rectangles.
- Interiors are sometimes fairly dark and often contain exposed concrete and possibly exposed utility features like pipes.
- Buildings are often designed with a large plaza or public space in front of the building. Sometimes the plaza extends underneath the building, since these buildings often have a recess on the first floor that allows the upper floors to extend out over empty space. The plazas sometimes have plants or landscaping, but these plazas are often dominated visually by concrete pavement and walls.
- More high-style buildings tend to show more creativity in the design of the geometrical forms, and details of poured concrete or masonry may be designed more carefully than less distinguished examples.
- Some of the buildings are highly symmetrical in composition, and the forms are arranged very regularly; other examples, such as the Yale Fine Arts Building, have more complicated asymmetrical compositions.
- More high-style examples of the movement have bold exteriors with massive blocks of concrete and cantilevered forms. The less-distinguished examples might have rough, massive concrete, but the exterior form may be more of a single rectangular box with a visual appearance that is less striking than that of a high-style Brutalist building.

New Formalism

(Most commonly appears in DoD buildings ca. 1960–1970)

This movement originated in the United States in the 1950s, and its early history is often linked to Edward Durrell Stone, who designed many government and university buildings. The movement seems to have reached a popular level of critical mass in the early 1960s and appeared throughout the rest of the decade, waning in the late 1960s as the popularity of Brutalism surged. New Formalism is sometimes viewed as a more appropriate style for buildings related to the arts, and it was often used for theaters and performing arts centers

where a sense of connection with traditional theaters and performance spaces of the past was desired, instead of a look that was avant-garde or futuristic. The movement was also used for government buildings like embassies. Look for the influence of this movement especially in military buildings constructed from about 1960–1967.

Important Features

- Lateral symmetry is used for the exteriors of buildings.
- Exteriors are often round, square, or rectangular, rather than being composed of more complex, asymmetrical forms
- Features like porches, vertical posts, arches, cornices, or simple domes are used to evoke a sense of Classical design
- Although Classical-like forms are used, moldings and other decorative features of Classical design are avoided; the buildings still have a simple “modern” look
- Materials can be poured concrete, brick or other masonry, steel, and glass.
- Rough textures are not as common as they are for Brutalist buildings. Concrete is more often finished with a smoother texture, or a decorative layer of small stones (aggregate) is included on the surface of the concrete to create textures and colors.
- Although traditional architectural forms are evoked in the designs, rooflines are often the typical flat Modernist profile.
- The shapes and forms of the exteriors of the buildings are often circular or large rectangular boxes. Porches are often used to give a sense of light and shadow instead of the cantilevering that is used to achieve light and shadow effects on Brutalist buildings or a sense of weightlessness of Miesian buildings. Structural elements might be exposed but they also might be hidden behind non-structural curtain walls made of glass or masonry units.
- Patterned masonry units such as concrete blocks with a pierced pattern were commonly used for exterior visual effects. Pre-cast concrete elements, especially vertical column-like elements, were also commonly used.
- To strengthen the Classical effects of the buildings, use of traditional exterior materials like brick or smooth stone veneer is seen on some of the buildings.
- Buildings are often designed with a large plaza or public space in front of the building. The plaza tends to reinforce the symmetry of the building. Complexes of multiple buildings are often arranged in highly symmetrical compositions.
- More high-style buildings tend to show more creativity in the use of Classical-like elements and proportions. More common examples may just be masonry boxes with a few vertical posts or arches applied to the front of the building to give a vague sense of Classical formality, but the formal characteristics were not applied in a thoughtful manner or with very much sophistication.

Expressionism

(Most commonly appears in buildings ca. 1950–1970)

This movement originated in the 1950s, and its buildings were Modernist but with curved shapes and dramatic sculptural effects, in contrast to the cubic forms that dominated Miesian design. In the United States, the movement bridges the 1950s and 1960s, in contrast to movements like Brutalism and New Formalism, which did not gain traction until the late 1950s or early to mid-1960s.

Expressionism was not heavily used for U.S. government buildings and was more commonly used for religious buildings, since the expressive quality of the architecture was seen as consistent with the spirituality involved with religion. Relatively few of the military building types covered in this study lend themselves well to Expressionist design, and the movement was probably seen by the military as inappropriate or too radical or eccentric to be used for military construction. It is also likely that the curved forms of Expressionism were difficult and more expensive to build, which would have conflicted with the desire of the armed forces to build in a manner that was more straightforward and practical.

Military chapels may be an exception to this overall tendency. For example, the U.S. Air Force Academy Chapel in Colorado Springs, with its tall, sweeping metal forms, could be seen as an example of architectural Expressionism, while much of the rest of the academy campus shows reliance on the cubic forms inspired by the Miesian movement and the Bauhaus. Several airport buildings in the United States, especially Eero Saarinen's air terminals of the 1950s and 1960s, could be considered Expressionist in form, but again, the military appears to have considered this type of design to be not suitable for military air facilities.

Important Features

- Exteriors often contain round or steeply gabled forms or curves.
- Dramatic cantilevering and overhangs are used.
- Vaulting and arches are sometimes used.
- Walls and support posts may be tilted or sloped.
- Rooflines may be flat but also may have curved, sweeping forms or steep triangular forms.
- The building may convey a sense of movement through the use of thin, lightweight forms or sweeping curves.
- Steel, poured concrete, aluminum, and glass are common materials. Brick and stone veneer were also used at times.
- In more high-style examples, the sense of sculptural form will permeate the entire building. In lesser examples, the overall building may have a more box-like form and be highlighted with features like porches or overhangs that have a more expressive form.

Assessing Integrity in Modernist Properties

Introduction

In general, the rules of material integrity as spelled out in the National Register guidelines apply to Modernist buildings in the same manner in which they apply to more traditional buildings. A building should be able to convey a sense of its time period and the architectural movements that shaped it. Buildings that no longer appear to be products of the time period in which they were constructed are generally not eligible because they do not convey a sense of feeling and association for that time period. For architectural significance, the building should retain a large number of its original features in order to convey a visual sense of the building's original design.

Special Integrity Considerations for Modernist Properties

There are some special considerations that need to be taken into account, due to the plain nature of nearly all Modernist buildings. In general, Modernist buildings from 1950–1975 do not have a large amount of detail that is purely decorative. Moldings, sculpted floral and foliage details, patterned masonry, or non-functional trim were elements that Modernist designers generally avoided. Limited amounts of this decoration might be seen on a very small number of early 1950s buildings that were holdovers from the Art Deco or Art Moderne styles, and later Modernist buildings from the mid-1950s and onward might contain some mosaic tile details or simple geometric patterns worked into structural materials like concrete block or brick, or maybe some examples of Modernist sculpture or other artwork. But overall, the lack of ornament is one of the major characteristics of Modernist design of the 1950–1975 era.

Because the buildings lack ornament, the windows and structural elements of the building are even more critical for the integrity of Modernist buildings than they are for more traditional buildings. On more traditional building reflecting a Classical, Colonial, or Medieval-inspired architectural style, ornamental details may be able to reinforce a building's level of integrity even if elements like windows and doors have been replaced somewhat inappropriately. For some traditional buildings, the form and proportions of the original window sashes may have been an important design feature, but the sense of massing and articulation for the building may also be closely related to features like capitals, cornices, overhangs, brackets, consoles, parapets, and sculptural friezes and medallions. These features often remain when some or all of the original windows and doors and have been replaced.

However, on Modernist buildings, ornament is kept to a minimum or is not present at all, making the original functional elements of the building—exposed structural frame, wall cladding, windows and doors—vital to the building's ability to convey a sense of feeling and association for the Modern movements. Alterations to wall cladding, windows, and exposed structural framing should therefore be given very serious consideration, as the alteration of these elements can have a particularly strong tendency to degrade the integrity of Modernist buildings. Interior remodeling, including enclosing formerly open spaces and adding woodwork, trim, or other traditional features, also compromises integrity.

Significant Elements for Frequently Encountered Architectural Movements and Styles

Different elements are more important depending on the architectural movements that have influenced a given building.

Miesian

Exteriors: With Miesian buildings, glass will almost always be a main consideration. The grid-like geometry of these buildings is usually defined by expanses of highly regular glass curtain walls or large windows, and the light pattern of these glass surfaces is usually a major element in the exterior composition of the building. In situations where the original windows have been switched out for ones that are considerably different in configuration than the originals, a critical element of integrity has been lost, and it is likely that the building would not have enough integrity to meet the eligibility requirements for Criterion C unless new windows or curtain walls were installed that closely matched the appearance of the originals.

Cubic proportions, massing, and form are also important for Miesian buildings, so alterations or additions that change the overall size and scale of the building, or that affect the flat rooflines that are characteristic of these buildings would also likely lead to an assessment of not eligible due to a low level of integrity. These alterations could include the construction of a large addition or the installation of a gabled or hipped roof on top of a flat roof. Some attempts have been made within the last thirty years to soften the forms of some Miesian buildings by adding gables, dormers, porches, and other traditional features to the buildings; be aware that these features are very destructive to the building's integrity.

Interiors: Interior features to watch for are large open spaces on the interiors of the building. These flexible-use open spaces were an important aspect of Miesian design. For buildings that have important interior spaces, watch for large open spaces that have been cut up and divided into smaller spaces by the addition of new walls—this technique can be very destructive to the integrity of a Miesian interior.

Other Modernism Movements

Some buildings of the 1950s or early 1960s show strong influences of Modernist designers other than Mies, such as Frank Lloyd Wright, Eero Saarinen, Le Corbusier, Marcel Breuer, or other significant designers. These buildings might have a somewhat different set of important features than a Miesian building.

Exteriors: Glass may be an important consideration, but these buildings may also feature the prominent use of reinforced concrete, metal, or even wood on the exterior. Forms may be cubic and regular or might be more irregular, diagonal, and asymmetrical, especially on buildings influenced by Gropius, Breuer, or Le Corbusier. In general, to retain integrity, it is important to retain the exterior glass and structural materials, and the original roofline, form, and proportions of the exterior.

Interiors: For the interior, materials and features may vary widely. In general, open space and original materials are important considerations.

Brutalism

Exteriors: For buildings associated with Brutalism, the structural elements of the building are usually the important features along with the sculptural quality of the building's overall form. These are elements that are less often replaced or obscured. Brutalist buildings have windows and doors, but glass tends to be a more minor item, and the window area is often relatively small, with the door and window voids of the design overpowered by masses of textured concrete. Or the light pattern of the windows may not be as important as the window area's role as a large area of dark shadow on the building's exterior. With buildings that have large areas of glass deeply recessed beneath massive concrete forms, the light pattern of the glass is less important than the overall effect of shadow that is created. In these buildings, the changing out of windows has a less destructive effect on overall integrity, as long as the solid-void relationship between the window and door openings and the solid walls and massive structural elements are maintained. On the other hand, the filling in of a recessed porch area, especially on the facade of a Brutalist building, would strongly alter the original sculptural effect of the building's exterior and likely result in an assessment of not eligible due to integrity loss.

Interiors: For interiors, retention of the original floor plan is important, along with continued exposure of bare structural materials, especially unfinished or textured poured concrete. Attempts to paint over exposed structural materials or cover them with plaster or wood trim are highly destructive to the interior of a Brutalist building.

New Formalism

Exteriors: In the case of New Formalism, it is often the shape and symmetry of the exterior features that is most important in conveying the architectural form of the building. The building should retain its original symmetrical layout, and the sense of solid and void relationship between glass areas and features like concrete posts and porches should be retained. Many of these buildings have highly regular geometrical porches or loggias on the exteriors, and these features should be retained in order for the buildings to have a level of integrity good enough for National Register eligibility under Criterion C. Some alteration of windows or glass walls is permissible as long as the overall design composition is retained. The filling in of void areas on exterior walls and especially facades should be avoided, as should the filling in of open spaces like porches.

Interiors: The general rules of retention of the original floor plan and materials are important. Exposed structural materials may have been part of the original design, although exposed structure may not be as prevalent in these buildings as in Brutalist buildings. Attempts to paint over or cover over original interior finishes with new gypsum board or with wood trim are highly destructive to integrity.

Expressionism

Exteriors: Expressionist buildings should retain their original form, and dramatic features like cantilevering or deep roof overhangs should not be removed or filled in. Since these buildings vary widely, the important elements of the buildings will also vary from building to building. Some buildings may have glass walls or windows that are highly important, while other

buildings may have exposed concrete posts, curved or domed roofing, or brick walls that are of higher importance.

Interiors: Due to the varied character of these buildings, it is advisable to stick to the general concept that original layout and materials should be retained. It is possible that a very wide variety of interior finishes would have been used in these buildings, and layouts could be highly open or somewhat more enclosed, depending upon the function of the building and the preferences of the designers.

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RESEARCHING MODERNIST PROPERTIES

Introduction

This section includes some notes on how military buildings from the 1950–1975 years are researched at Hardlines Design Company (HDC) for historic inventory and evaluation studies. The notes include advice on research at sites both on and off of military bases and installations, in order to document a building's history and especially its architectural design.

Many details of this discussion are specifically geared toward researching military buildings of the 1950–1975 era. However, the overall research process as outlined in this section of the report applies, in a general way, to researching United States military buildings of the first half of the twentieth century (1900–1949) as well. The research process for buildings of this earlier era is quite similar in overall outline to what one would do to research a building from the 1950s or 1960s. The availability of some sources will vary depending on the time period that is being covered. For example, the authors have found that base newspapers and newsletters were commonly printed and retained by base libraries, History Offices, and Public Relations Offices for the World War II years and for the 1950–1975 period. Some installations also appear to have had base newspapers during U.S. involvement in World War I (1917–1919). When researching a building constructed from ca. 1900–1916, this resource might not be available, as many installations appear not to have had a base newspaper or newsletter during this time frame, or these documents may not have survived as part of the historical record.

The recommendations presented here are based on the experience of the HDC staff as they conducted building surveys at DoD installations across the continental United States. Because of the company's specific mix of clients, this section relies mainly on surveys at Air Force Materiel Command (AFMC) and U.S. Navy installations, and at U.S. Army Corps of Engineers facilities. Installations that are not associated with Corps of Engineers installations, or installations that are associated with Air Force commands other than AFMC, may have somewhat different setups for maintaining their historical records than those represented here, but the overall process should apply in a general way, at minimum.

Note that researching buildings usually involves interacting with many on-base agencies. A typical building survey may require you to contact base Civil Engineering, Real Estate, History, and Public Affairs offices. It is important to have the on-base sponsor of your building survey (usually the base's Civil Engineering, Facilities, or Environmental Office) coordinate access to these offices ahead of time so that these organizations know that your project is official DoD business, and so they can give you their full cooperation.

Sources

Below is a list of the types of sources that HDC researchers consult when investigating military buildings from the 1950–1975 period. Most of these sources also apply to buildings constructed during the 1900–1949 timeframe.

On-Base Sources
- Construction drawings
- Real estate record cards
- Base maps
- Archival photographs
- Previous histories or survey reports
- Base newspapers or newsletters
- Interview

Off-Base Sources
- National Archives, Library of Congress
- Journal articles
- Histories of architectural firms
- Interviews with architects
- Archival photograph collections

On-Base Sources

Construction Drawings

Construction drawings are probably the single most important source for documenting the design and construction history of a building. These drawings are usually held at the installation's Public Works Office or Civil Engineering Office. Sometimes, the drawings have been scanned and are available from a database that can be accessed electronically on one of the computer terminals at the Public Works Office. Some installations also still retain the original printed drawings (non-electronic copies on paper, vellum, or linen), which are usually stored in flat files in the Public Works Office, or sometimes in a vault or separate storage facility. It is always good to look at the original printed drawings if possible, as the resolution on the scanned images may not always be high enough to clearly reveal some details, or occasionally some text or marks are cut off during the scanning process. However, in some cases, it is simply not practical to pull the original drawings, and the electronic files are all you have to work with. You can usually have these electronic drawing files burned to a CD or DVD.

The main source to look at are the original drawings that were completed when the building was constructed; these drawings will have the most information about the original character of the facility. Most Civil Engineering offices also retain later drawings that document changes made to the building over time, and these alteration drawings may includes drawings for window replacement projects, additions, re-cladding of exteriors, re-roofing, and interior remodeling. The alteration drawings provide important information on when and how the building was changed over time. Important information contained on the original drawings includes:

- Who designed the building. The title block of the drawing should have the name of the architectural firm or government agency that designed the building. The title block may also have signatures of specific designers who worked on or oversaw production of the design drawings.
- Documentation of changes during construction. Many drawings will have a box that contains alterations that were made to the drawings while the building was being constructed, as a result of change orders or other changes that were made that would have caused the building to not match what was delineated on the drawings. These notes can provide insight into the construction process and also provide some dates that indicate when the building was under construction.

- The "as-built" stamp. This feature is a stamp on many drawings that includes the word "as built" and often a date. The stamp was placed on the drawings when construction was completed, to indicate that the drawings reflect the building as it was actually constructed. The as-built stamp can also help indicate that the drawing sheet you are looking at was used to build a project and was not just a study drawing that was drafted but never used for construction. The date of the as-built stamp is usually a good indicator of when construction was completed on a building. For example, if a drawing's as-built stamp is dated November 17, 1957, it is clear that the construction on the building was complete by that date, or possibly earlier. In contrast, the dates on the main title block of the drawings usually refer to the dates for completion and approval of the drawings, events that typically happened before the building was constructed.
- Documentation of the building's original features. If the interior layout of the building was changed through the years, or if there were additions or alterations like replacement of the original windows or addition of new door and window openings, an original set of as-built construction drawings should show you what the building was like when it was finished. The drawings may record the appearance of features on the building that have been removed or that are currently covered up by later remodeling.

However, one must be careful to check and make sure that later alterations to the building were not added to the set of drawings you are working with. Sometimes Public Works staff marked up original sets of construction drawings to record interior remodeling, exterior changes, or additions to the building. Make sure that the set of drawings you are using does not include later alterations. In some instances, the author of the alterations leaves a date and notation on the drawing so you can tell when the updates were made, but this is not always the case. Also, sometimes you can tell that a notation was added to a drawing because the writing will be in a different style of lettering than that of the original drawing.

Real Estate Record Cards

These resources are usually note cards that contain information on a specific building. They often contain the building number, original function of the building, later changes in function, square footage, construction costs, building dimensions, records on heating and air-conditioning equipment, the military organization the building was associated with, and notes on changes to the building that were made over the years. These resources are important as documentation of the building's original function, condition and dimensions, construction cost, and may also provide information on when specific changes were made. For example, from observing a 1950s building, you may be aware that the windows are not original, but it may be difficult to tell when the new windows were installed. The real estate record card may contain a note indicating the exact date when the windows were replaced.

Many Air Force bases have retained original real estate record cards; sometimes these cards are located at the Civil Engineering Office, or they may be stored at a Real Property Office, or if the installation has a museum or base History Office, they may have been moved there. In some cases, the cards may have been scanned or discarded. Most Naval installations have not retained original property record cards, although in some instances, these cards have been transferred to Navy construction battalion archives at Port Hueneme, California.

Base Maps

It is always a good idea to look for old installation maps. These maps do not provide as much detail as construction drawings or property record cards, but they do show the footprint of the building at a given time, which may be useful for determining when additions were built, especially if the construction drawings are not available. Some base maps also include a list of buildings and their functions, which can be useful for determining when a building stopped being used for its original function, and what function a building was serving at a specific time. These maps are a snapshot of the layout of the installation on a given date, and they show how the surroundings of the building have changed over time, including when buildings were demolished in the past. These resources are valuable for assessing how the surrounding context of a building has changed over time.

Archival Photographs

Some installations have retained early photographs of the base, which can be very useful for documenting the construction of a building, its original appearance and condition, and later changes that were made. The photographs might be held at Public Works or Civil Engineering Offices, a base museum, or the installation's History or Public Relations Offices. Also, sometimes originals or copies of the photographs are framed and displayed in base administrative buildings.

Previous Histories or Survey Reports

Some type of history texts have been written for every military installation. These histories can take the form of an overall history book or typed manuscript about the entire installation. Also, most military units that would have operated out of or managed a base will have histories that were written every six months or so to record major events that happened in connection with the unit. Sometimes these histories mention buildings and information on their construction, function, or alteration. In addition, some History Offices at bases have written summary texts about the histories of specific buildings, which are also a good way to quickly gather information on a building. It is also possible that base and unit histories, and possibly even building histories, may have been sent to archive facilities (discussed under "Off-Base Resources," page 111); if your project has the budget to consult these facilities, it is a good idea to do so.

The Environmental, Public Works, or History Office may also hold copies of previous survey reports or HABS/HAER reports that were completed at the base as part of past inventory and evaluation efforts. These reports can contain valuable information on the building you are evaluating. However, it is always wise to be careful about the information contained in previous survey reports—survey reports do sometimes contain errors or information that has been incorrectly interpreted. It is necessary to check what is written in histories and survey reports against older sources, such as construction drawings and property record cards, to ensure that the information is accurate.

Written histories may also at times contain inaccurate information, such as rumors about the design of a building that have been repeated so often over the years that they have become accepted as fact. It is always a good idea to check historical write-ups against other sources, especially if these texts are informal documents that were not assembled according to accepted historical research methods.

Base Newspapers or Newsletters

Most installations had a newspaper or newsletter, copies of which have often been placed in storage or kept at the base History Office, Public Affairs Office, or library. These newsletters are valuable because they sometimes cover the design and construction of new buildings. The articles may contain the names of construction contractors or architects, chronicle construction progress, and mention that the building won architectural awards or was published in an architectural or construction journal. In rare cases, you might be able to find copies of these documents in off-base libraries, but usually on-base repositories are the first place to look.

Interviews

Base personnel can be a valuable source of information about the buildings you are surveying. Sometimes information has been passed down by word of mouth over the years by personnel at the base. If a building dates from the 1960s or 1970s, it is quite possible that older employees or retirees who are still in the area may remember the construction of the building or the condition of the building before more recent alterations were made.

However, always attempt to verify oral information against written records, photographs, or construction drawings. Although oral information is often quite valuable and reliable, it is sometimes distorted over time, or inaccurate information is perpetuated.

Off-Base Resources

Some resources will likely not be held on base because they are not documents that were not generated by the military. Other off-base resources are items that were generated by the military but have been archived at facilities like military archives, state historic preservation offices, state archives, or the National Archives.

National Archives / Library of Congress

The National Archives may hold a number of sources related to military buildings, some of which are mentioned in the above section on sources you are likely to find at military installations, and some of which are often not held at military installations. The sources that may be held at the National Archives include:

- Correspondence discussing the design and construction of buildings
- Construction specifications for buildings
- Construction drawings and base maps
- Base master plan documents
- Archival photographs

The National Archives includes central locations in Washington D.C. and College Park, Maryland, plus a large number of regional archives that hold records from different regions of the United States. The records in the archives are organized in a series of numbered record groups, usually beginning with the letters “RG.” In addition to the record groups associated with the specific service branch you are dealing with, there are also separate RG numbers for organizations that may have been involved in the design and construction of your building. For example, the U.S. Army Corps of Engineers was in charge of design and construction for many Air Force buildings during the 1950s and 1960s.

It is also possible that your building was covered in a HABS/HAER (Historic American Buildings Survey/Historic American Engineering Record) documentation, or similar buildings or buildings by the same architects may have been documented. Much of the federal HABS/HAER collection is now accessible online at http://memory.loc.gov/ammem/collections/habs_haer/. State-level HABS/HAER documentation that was not submitted to the National Park Service is usually available at the State Historic Preservation Office, local historical society, or state historical libraries.

Journal Articles

Sometimes Modernist military buildings were published in architectural journals. These articles can give important information on the building and its design, on the architects, and may also contain photographs of the building as it appeared when originally constructed. Important journals for the 1950–1975 era are:

- *Architectural Digest*
- *Architectural Forum*
- *Architectural Record*
- *The Architectural Review*
- *Progressive Architecture*

These journals are often held by local college or university libraries, especially those with architecture schools. In many cases, these periodicals may be accessible online; older sources are becoming more and more available via online sources.

Histories of Architectural Firms

These sources can include published books about architectural firms that can be found in your local public library or in university libraries, especially universities that offer architectural degrees. In addition, the Internet now contains information on architectural firms, either in connection with modern architecture websites or databases, or on the websites of the firms themselves. These sources include histories of architectural firms and oral history interviews with retired architects, including some of the important designers associated with Modernism in the United States.

As with oral history sources, it is important to match up information you find on the Internet with other sources. Some websites will contain well-researched and well-documented histories, but others may contain information that has not been thoroughly researched or may present anecdotal information or opinions as if they were facts.

Interviews with Architects

Extensive interview work has been conducted in the last twenty years with architects associated with the important Chicago firms of the 1950s through the 1970s. For example, the text of interviews with Walter Netsch, the main project architect for the U.S. Air Force Academy campus, are now available online through the Art Institute of Chicago's Chicago Architects Oral History Project, accessible at the following address:
http://www.artic.edu/aic/libraries/research/specialcollections/oralhistories/about.html
Other significant designers interviewed as part of the Chicago Architects project include Gordon Bunshaft, Charles Murphy, Paul Schweikher, and Paul Rudolph.

Bear in mind that the interviews reflect the personal views and opinions of the person being interviewed, which may conflict with the information contained in written histories or other oral history sources.

Archival Photo Collections

Sometimes the architectural offices themselves have archival photographs of their buildings, and these can be very valuable in documenting aspects of the original appearance of a building if it has changed extensively over time. Often, firms have an archive of photographs of past buildings and are sometimes able to provide them digital in a format that can be easily incorporated into evaluation reports.

Some museums and archives also house significant photograph collections. Especially useful is the archive of the Hedrich Blessing architectural photography firm of Chicago. This firm photographed many of SOM's buildings during the 1940s and 1950s, as well as some architecture designed by other important firms. The Hedrich Blessing Archive is now held by the Chicago Historical Society and can be accessed at their museum.

Military Archives

Several organizations hold military records that may be related to buildings, including the Naval Historical Center at the Washington Navy Yard; the Construction Battalion Archive at Port Hueneme, California; and the Air Force Historical Research Agency at Maxwell Air Force Base, Alabama. Please note that these places require the advance coordination of an appointment to do research, and some may have security restrictions on what materials may be viewed by civilians without DoD security clearance. These institutions can hold base and unit histories, archival photographs, maps, construction drawings, and property record cards that may be helpful in documenting your building and assessing its architectural significance.

DoD Contexts and Guidance

The DoD Legacy website contains a context report archive with many important studies that have been conducted on different types of military buildings:

http://denix.osd.mil/cr/HistoricBuildingsStructures/ConTextStudies.cfm

These studies can give you more overall background about the building type you are dealing with and can provide insight into how to handle National Register eligibility evaluations for specific building types.

Local Newspaper Accounts

Sometimes local newspapers have covered the design or construction of a military building, although more commonly, it was covered in the base newsletter. In some cases, the installation Public Affairs or History Office or the installation library will have files of clippings from articles, or you might find the articles in a clippings file at a local public library or historical archive. Some local newspapers have an article subject index you can use to find articles on specific subjects more easily. The articles may include text as well as photographs or reproductions of architectural renderings of the buildings, all of which may prove useful for your project.

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Notes on Photograph Sources

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- Images in the context that are associated with Historic American Buildings Survey (HABS) or Historic American Engineering Record (HAER) documentation are from the American Memory website at http://memory.loc.gov/ammem/index.html, which is maintained by the Library of Congress.

Photographs by Hardlines Design

- Recent building photographs (1997–2012), especially of buildings at Wright-Patterson Air Force Base, were taken by HDC staff as part of past inventory and evaluation projects. Photographs of buildings on Air Force installations are being used with the consent of the United States Air Force.
- All current photographs of the sample survey buildings in Appendix A were shot by HDC staff in 2011.

Other Non-Web Sources

- Many images in the context were provided courtesy of the Skidmore, Owings & Merrill (SOM) digital library of architectural photography. SOM provided numerous archival images by the architectural photography firm Hedrich Blessing, as well as images by other photographers. The Hedrich Blessing firm photographed many of SOM's buildings during the 1940s and 1950s, as well as some architecture designed by other important firms. The Hedrich Blessing Archive is now held by the Chicago Historical Society and can be accessed at their museum.
- Several archival images of Wright-Patterson buildings were obtained from the 88th Air Base Wing History Office, which maintains an extensive collection of archival images of Wright-Patterson Air Force Base.
- Other images used are held by other archives, libraries and installation history offices. These images were used with permission or were materials offered for public use without restrictions.

APPENDIX A: SAMPLE ASSESSMENTS OF SIX BUILDINGS AT WRIGHT-PATTERSON AIR FORCE BASE

Introduction

This section aims to demonstrate how you might use the information in this document to evaluate the architectural potential of some fairly typical 1950–1975 Modernist buildings, the kind you might see at military installations in the United States. This work was performed at Wright-Patterson Air Force Base from September–October 2011 by HDC staff, assisted by the 88th Air Base Wing Civil Engineering Directorate.

HDC has selected six buildings (three individual buildings and one three-building complex) whose construction dates are within the time period covered in the survey; three are from the 1960s, and the three-building complex dates to the 1970s.

- Building 20620, Electronics Warfare Facility, 1966–1967
- Buildings 20651, 20652, and 20653, Manufacturing Technology Laboratory Complex, 1974
- Building 31222, Airmen Service Club, 1965
- Building 31239, Base Theater, 1966

Most buildings from the 1950s that would have been appropriate for this study have been evaluated in past studies and were therefore disqualified to be samples in this document. Please note also that some of the resources (Buildings 20620 and the Building 20651–20653 complex) were covered in a past building evaluation at Wright-Patterson Air Force Base during the 1990s (Hay et al. 1996), but the focus of that evaluation was solely on the Cold War military and research significance of these properties and did not discuss their architectural merit under Criterion C as representations of architectural Modernism. For this current study, HDC completed additional original research on these buildings and their designers, adding significant new information that is useful in considering the architectural merit of these buildings. The remaining two buildings (31222 and 31239) have not been covered in any previous building surveys at Wright-Patterson.

The buildings in this section reflect the character of Wright-Patterson Air Force Base; be aware that the buildings you encounter in other parts of the United States might have different design characteristics, depending upon regional preferences or materials. The building discussions are organized by building number.

For each building, we have provided a short description, an assessment of the integrity, a brief history, and a typical analysis of Criterion C eligibility potential for the building; photographs are also included. Buildings that are less than fifty years old are also evaluated under Criteria Consideration G, for exceptional importance. Although official, comprehensive recommendations for the National Register are not provided here, as that is not the purpose of this project, the assessment does indicate whether the building's potential to be eligible would be high or low under Criterion C (and Criteria Consideration G, when appropriate). All of the research sources used for these assessments were locally available materials that HDC obtained from Wright-Patterson, online sources, the HDC company library, and other library repositories in the Columbus and Dayton, Ohio, metro areas. No out-of-state research trips were needed to locate any of the information recorded below for the buildings.

Building 20620, Electronics Warfare Facility, 1966–1967

Figure 48. Building 20620, tower looking northeast, original 1966–1967 portion of building

Designer: Dalton & Dalton, Architects and Engineers, Cleveland, Ohio

Stylistic Influences: The building features extensive use of exposed textured concrete in the form of heavy geometrical beams and large blocks. These features indicate strong influence from the Brutalist movement.

Construction/Engineering: Has unusual twelve-story tower structure, consisting of two reinforced-concrete shafts connected at the top by a series of horizontal concrete decks with test laboratories in between the decks. The towers were built to facilitate research into subjects like satellite-based air-to-ground communications and experiments with the improvement of target-location radar systems.

Description: Building 20620 is a three-story, poured-concrete facility with an irregular floor plan. The building features a series of concrete beams with textured aggregate, with rows of ribbon windows in between. Other sections of the building are large boxy areas of concrete with a vertical linear texture hammered or molded into the concrete. The building sits on a large open lot with a mix of grass lawn and parking lots. The most remarkable feature of the exterior is a large twelve-story tower structure, composed of two reinforced-concrete shafts connected by a series of concrete slabs. Extensive access was not granted to the interior, but it appears to be composed of a mix of office spaces with drop acoustical ceilings and reinforced-concrete laboratory areas. The building features a specialized anechoic chamber that has been used for various research purposes related to radar signatures and other subjects.

Integrity: The windows appear to have been replaced, but the exterior reinforced-concrete envelope is well preserved. Overall, the interior has undergone some interior remodeling during its years of service, based on property record cards that record numerous alterations inside the building during the 1970s and 1980s. Many of the interior public spaces are composed of spaces with gypsum board and painted concrete-block walls, acoustical tile drop

ceilings, and concrete floors. The interior does feature the anechoic chamber. Additional space was added to the building in the mid-1990s.

History: Construction drawings for this building were completed by Dalton & Dalton and are undated, but they appear to have been drafted and approved in 1965, based on the building's known construction timeline. Construction was well underway by March 4, 1966, since at that time, Wright-Patterson's base newspaper, the *Skywrighter*, ran a story about the scaffolding on top of the tower catching fire during construction. The building was dedicated in June 1967, and the original construction cost was $1,374,718.00.

Building 20620 was used to accommodate various types of research on electronic warfare, including work on satellite guidance systems, improvement of target detection systems, electronic countermeasures, and cross-section reduction technologies. The building has been continually used for research purposes during its entire existence.

Additional permanent laboratory and administrative space was added to the building ca. 1995–1996. According to construction drawings and aerial photographs, the 1990s addition is the north wing of the facility, which is built in a style that closely mimics the exterior appearance of the original building. Although the north-wing addition has changed the form and massing of the building somewhat, a courtyard separates the wing from the original building, leaving the overall form of the original building still visible. Still, the addition has somewhat diminished the form and proportions of the original 1966–1967 building.

A study focusing on possible exceptional historical significance of the Wright Laboratory facilities at Wright-Patterson (Hay et al. 1996) cited Building 20620 as being exceptionally significant because of research conducted there that helped pave the way for Stealth technology, which allowed aircraft to evade radar detection. However, it should be noted that some researchers who currently work in the building dispute that the building was used for research that contributed to Stealth systems. Additional investigation on the building may be performed in the future to assess its role in Stealth technology. The 1996 study did not comment on the architectural merit of the building, since the study focused exclusively on the Cold War significance of the technological research carried out in the building.

Building Assessment: The original overall three-story portion of the building is a fairly good, although not outstanding, example of Brutalism, with the exterior composed of a series of large box-like concrete beams and large blank concrete masses with vertical linear texturing. The main portion of the building does not, however, feature any of the large, bold cantilevered concrete forms that give many Brutalist buildings their striking appearance, although some fairly small cantilevered decks are included on the building's tower.

Still, the building's tower is an unusual feature that is related to the original research function of the building, and is also an area landmark. The tower is an unusual example of Brutalist design principles applied to a large vertical structure. The four concrete cantilevered decks of the tower, attached to the top of the two tower shafts, give this portion of the building a bold, sculptural appearance that is in keeping with the spirit of high-style Brutalism.

Constructed in 1966–1967, Building 20620 is a few years short of being fifty years old, and so Criteria Consideration G must also be applied. The building is probably not a good enough example of Brutalism to qualify for exceptional architectural significance at this time (2012). The building has also lost some integrity of form and massing due to the 1995–1996 north

wing addition. However, the facility's tower is a distinctive and unusual example of the application of Brutalist architectural principles to a tall tower structure, and so the building's architectural design should be given serious consideration in terms of Criterion C architectural significance, once the building reaches fifty years old, around 2016–2017.

Modernist Historic District Potential: The building was constructed in a laboratory and educational portion of Area B of Wright-Patterson, where the area is laid out with a grid network of roads. The building is positioned near Building 20600, a similarly designed reinforced-concrete building that holds similar functions. The two buildings sit on a grass lawn and have some landscaped courtyard areas between the wings of the buildings, although no unusually significant design layout features were observed. The area around the buildings has a mix of buildings from different decades and does not seem to form a coherent composition of Modernist buildings that would be eligible as a group.

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Wright-Patterson Air Force Base. 1967. Real Property Record Card for Building 20620. On file at 88th Air Base Wing Civil Engineering Office, Building 30011, Wright-Patterson Air Force Base, Ohio.

Additional Photographs of Building 20620

Figure 49. Building 20620, courtyard looking southeast, original 1966–1967 portion of building

Figure 50. Building 20620, south wall, looking north, original 1966–1967 portion of building

Figure 51. Building 20620, north wall entrance, looking southeast, showing 1990s north wing addition

Figure 52. Building 20620, second-floor corridor

Figure 53. Building 20620, interior, anechoic chamber

Buildings 20651, 20652, and 20653, Manufacturing Technology Laboratory Complex, 1974

Figure 54. Overview (left to right) of Buildings 20651, 20652, and 20653

Designer: A. M. Kinney Architects and Engineers, Cincinnati, Ohio

Stylistic Influences: Modernistic in terms of cubic forms and flat rooflines but does not show strong evidence of high-style Modernism.

Construction/Engineering: These buildings have a reinforced-concrete structural frame and appear to have some areas of concrete-block, load-bearing wall. All structural materials are covered on the exterior with red brick veneer. The buildings used standard construction technology for their time period and are not exceptional in terms of engineering.

Description: The buildings are a series of cubic laboratory buildings with red brick exteriors. At four stories, Building 20653 is the tallest of the three buildings, with the other two buildings each having two full stories and a basement built into a hillside so that only the rear side is fully exposed. Each building has a plain brick exterior envelope with a series of small slit-like ribbon window openings fitted with aluminum windows. The interiors of the buildings are composed mostly of a series of painted concrete-block corridors leading to remodeled office and administrative spaces, and laboratory facilities that consist of large rooms with exposed concrete and concrete-block walls, plus concrete ceilings and floors. Building 20653 features a lobby with coffered concrete ceilings, and a fairly plain auditorium space that contains some original buff-colored glazed terra-cotta block in a plain design.

Integrity: The windows and doors appear to have been replaced, but since the buildings have very little glass on the exterior, these alterations have not had a major effect on the integrity of the exterior. The interiors have had some remodeling, especially the walls, floor, and furnishings of the lobby of Building 20653, but overall, the corridor and laboratory spaces retain their original layout and finishes, which usually consists of drop acoustical tile ceilings and painted concrete-block walls. Overall, the complex of buildings has a high level of integrity.

History: Property record cards show that the buildings were completed on October 29, 1974, at a cost of nearly $11 million for the entire complex. An article in the *Skywrighter*, the base newspaper, indicated that the laboratory tenants of the buildings were moving into the completed facility as of January 10, 1975. The architectural design for the complex was by A. M. Kinney, a Cincinnati firm that had designed a series of fairly plain, practical engineering laboratory and testing buildings at Wright-Patterson during the 1950s and 1960s.

Advance planning for this laboratory complex had begun as early as the late 1960s to augment research facilities at the base. The *Skywrighter* article emphasized how the design of the buildings was geared mainly toward practicality and function. The original research and testing purposes of the buildings are listed below. Research in the complex focused on materials analysis and laser-related subjects.

- Building 20651: Electromagnetic Materials Survivability; laser and electromagnetic research
- Building 20652: Systems Support; analysis of materials for aircraft
- Building 20653: Materials and Manufacturing Technology; research related to the use of computer technology in manufacturing

Two additional buildings were added to the complex in 1985–1986, Buildings 20654 and 20655, which were also research and test facilities.

A 1996 study by Archaeological and Historical Consultants Inc. recommended that this research did not qualify any of the buildings of the complex to be eligible for the National Register under Criterion A and Criteria Consideration G for significance in Cold War technological research. Today, the buildings are still used to house scientific research and associated support activities.

Building Assessment: This complex of buildings represents a fairly conservative version of Modernism. The buildings are cubic in form and composed on the exterior of mainly red brick, with a number of small bands of ribbon windows punctuating the exteriors. Interiors are architecturally unremarkable and include a fairly plain lobby with a concrete coffered ceiling, with numerous corridors composed of painted concrete-block walls and acoustical tile drop ceilings. Laboratory spaces have exposed concrete ceilings, reinforced-concrete support posts, and poured-concrete floors. The complex does not have any unusual architectural features such as significant use of glass curtain walls, wide-span steel truss roofs, cantilevering, or the distinctive use of poured concrete. The complex does not appear to be linked to any specific Modernist architectural movement and is fairly plain in character, being somewhat reminiscent of a conventional 1970s-era private-sector office park or research campus. A. M. Kinney designed a large number of laboratories at Wright-Patterson, but this one is not remarkable for engineering, and the firm does not appear to have been known as significant for producing high-style Modernist designs.

Built in 1974, this complex of buildings is well under fifty years old and would need to be exceptionally important in architecture or engineering under Criteria Consideration G to be eligible for the National Register at this time. The buildings have a low potential for National Register eligibility under Criterion C and do not have the exceptional importance necessary for Criteria Consideration G.

Modernist Historic District Potential: The complex is located in a portion of Area B that was developed in the 1960s and later, for laboratory and educational uses. The complex is part of a five-building arrangement, with the buildings interconnected for convenience. The buildings are positioned on a hillside, with the site composed of grass lawn and asphalt parking lot. No unusual landscape or site planning features were observed during fieldwork. The group of buildings and its site do not appear to have sufficient architectural or landscape design distinction to be eligible as a historic district associated with Modernism.

Sources

Construction Record Drawings, Building 20651, 20652, and 20653, 1974–2011. Electronic copies on file at 88th Air Base Wing Civil Engineering Office, Wright-Patterson Air Force Base, Ohio.

Hay, Conran, Wendy Zug-Gilbert, Margaret Pickets, and Douglas Dinsmore. 1996. *Documenting the Cold War Significance of Wright Laboratory Facilities, Wright-Patterson Air Force Base.* Prepared for Archaeological and Historical Consultants Inc.; sponsored by Office of Environmental Management, 88th Air Base Wing, Environmental Management Office, Wright-Patterson Air Force Base, Ohio.

Historic Building Files for Buildings 20651, 20652, and 20653. 2011. On file at 88th Air Base Wing History Office, Building 20014, Wright-Patterson Air Force Base, Ohio.

Skywrighter. 1975. "Materials Lab Moves to New Facility." January 10, 1975:23. On file at 88th Air Base Wing History Office, Building 20014, Wright-Patterson Air Force Base, Ohio.

Wright-Patterson Air Force Base. 1975. Real Property Record Cards for Buildings 20651, 20652, and 20653. On file at 88th Air Base Wing Civil Engineering Office, Building 30011, Wright-Patterson Air Force Base, Ohio.

Additional Photographs of Buildings 20651, 20652, and 20653

Figure 55. Building 20651, east wall entrance, looking west

Figure 56. Building 20651, southeast corner, looking northwest

Figure 57. Building 20651, second-floor corridor, looking north

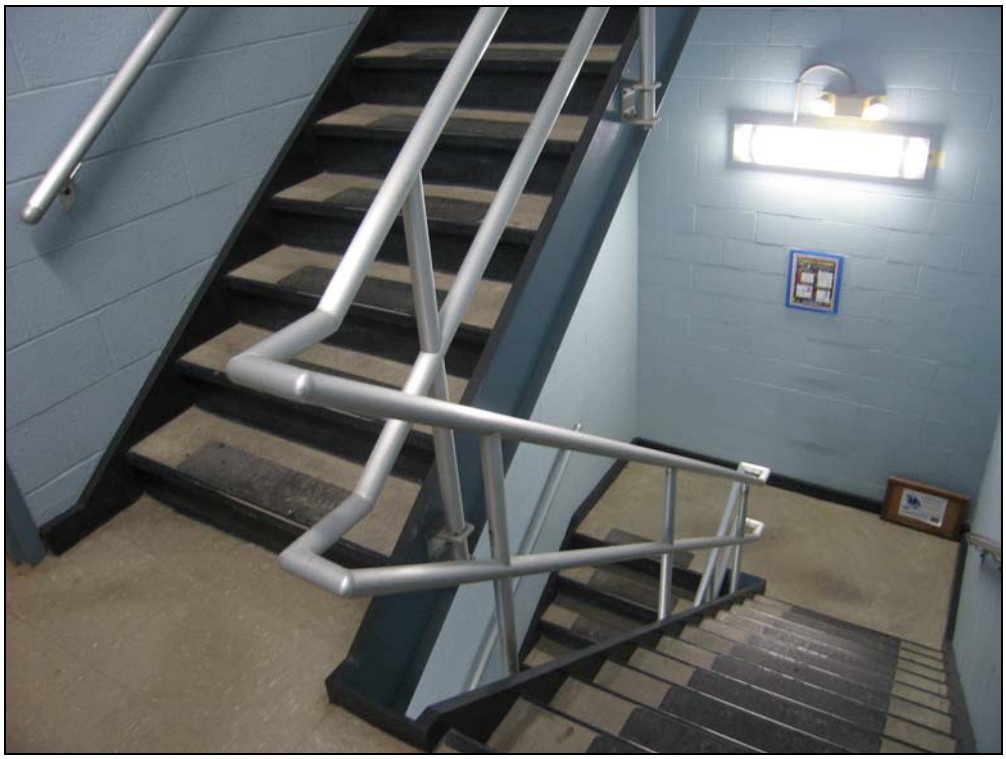

Figure 58. Building 20651, stairwell, looking south

Figure 59. Building 20652, southwest corner, looking northeast

Figure 60. Building 20652, west wall, looking east

Figure 61. Building 20652, ground-floor corridor, looking north

Figure 62. Building 20652, second-floor corridor, looking west

Figure 63. Building 20653, northeast corner, looking southwest

Figure 64. Building 20653, east wall, looking west

Figure 65. Building 20653, southwest corner, looking northeast

Figure 66. Building 20653, lobby, looking southwest

Figure 67. Building 20653, auditorium, looking southwest

Figure 68. Building 20653, second-floor corridor, looking north

Building 31222, Airmen Service Club, 1965

Figure 69. Building 31222, southeast corner, looking northwest

Designer: Currently unknown; original construction drawings were not found in the 88th Civil Engineering electronic archives. The building is possibly based on a standard design by the U.S. Army Corps of Engineers. It may also have been designed by Daniel, Mann, Johnson & Mendenhall, Architects, Washington, D.C., or the Wright-Patterson Directorate of Civil Engineering. Both of these organizations designed other nearby buildings at the Kittyhawk Center in the 1960s.

Stylistic Influences: Modernistic in terms of cubic forms and flat roofline but does not show strong evidence of high-style Modernism.

Construction/Engineering: This building has a steel structural frame with concrete-block wall infill that is covered on the exterior with brick veneer and textured concrete panels. The building used standard construction technology for its time period.

Description: This building is a two-story facility located on a grass lot in the Kittyhawk Center portion of Wright-Patterson. The building features areas of brick wall and other exterior areas composed of vertical registers of glass and textured concrete panels, with the registers separated by thin brick pilasters. The interior has a lobby, lounge, and auditorium on the first floor, along with smaller food-service rooms. The second floor has a series of small and large rooms with gypsum board walls, acoustical drop ceilings, and concrete floors. The interior spaces are mostly plain and functional, with the only distinctive features being a split-faced

concrete-block fireplace in the first-floor lounge, and a suspended steel staircase between the first-floor lobby and the second floor.

The Kittyhawk Center contains retail and recreational facilities for the installation, including retail stores, a bowling alley, and the base theater. Kittyhawk is composed of a grid of streets and a series of large asphalt parking lots, with smaller areas of grass on which the buildings sit.

Integrity: Building 31222 has a very high level of integrity on the exterior. The exterior brick, concrete, and split-faced concrete-block exterior envelope is completely intact. The aluminum-frame windows appear to be the original units, and the doors also appear to be the original metal and glass units. The first floor of the interior has had some remodeling, especially in the pool table area and the auditorium, but overall, the layout appears to be intact; many original interior finishes are still in place, including the original split-faced concrete-block fireplace in the pool table area, and the original suspended metal staircase to the second floor. The second floor also retains the original layout and has been altered little except for new carpet and possibly the replacement of drop acoustical ceiling and lighting. Overall, the building has a very high level of integrity.

History: This portion of the base was known from World War II onward as "Wood City," until the name was changed in the 1970s to "Kittyhawk Center," in honor of the Wright Brothers. Wood City included a service club, which was a recreational building for non-officers; these facilities typically contained spaces for dances and other social events, and other recreational equipment such as pool tables.

In 1963, the Service Club at Wood City was housed in a World War II temporary wood-frame building that was on the site of what is now the Base Theater (Building 31239, discussed on page 143). An article in the Wright Patterson *Skywrighter* dated January 25, 1963, indicates that the Wood City Service Club had been recently destroyed by fire, necessitating the construction of a new service club, Building 31222, construction of which appears to have begun some time in 1964.

Property record cards show that the building was completed around May 1965 at a cost of $266,137.06. An article in the *Skywrighter* from April 30, 1965, indicates that the facility was built as a service club for airmen, and opened on or around May 1, 1965. The facility would have had recreational facilities for airmen at the base. Although original plans were not found, the layout of the building is still fairly intact, and we can extrapolate that the building originally featured a lounge with fireplace; an auditorium space that could be used as a ballroom, theater, or athletic area; other recreational rooms; and a series of small booths for making phone calls. The use of split-face concrete block is similar to the nearby Building 31239 Base Theater (built 1965), so it is possible that Building 31222 was designed by Daniel, Mann, Johnson & Mendenhall, Architects, Washington, D.C., who designed the Base Theater. However, HDC has not been able to confirm this.

Building 31222 has continued to be used for recreational purposes. The property record card for the building recorded no major alterations to the building between 1965 and 1992. Currently, the building's first floor has been renovated, but the second floor is empty and is awaiting renovation.

Building Assessment: This building represents a fairly conservative version of Modernism. The building is cubic in form, and composed on the exterior of a combination of red brick veneer,

aluminum windows, concrete panels, and a few areas of split-faced concrete block. The exterior composition features an exterior rectangular box, with the windows and concrete panels arranged vertically, with each vertical arrangement separated by thin brick pilasters. The interiors are architecturally unremarkable and include a fairly plain lobby, a lounge with a split-faced concrete-block fireplace, a plain auditorium with a wood floor and stage, and a series of fairly plain rooms on the second floor with gypsum board walls and acoustical tile ceilings. The one distinctive architectural feature of the interior is a suspended steel staircase located in the lobby and leading to the second floor.

Constructed in 1965, Building 31222 will not turn fifty years old until 2015. Criteria Consideration G therefore must also be applied. The building's conservative version of Modernism is unremarkable architecturally, so this building clearly would not meet the more stringent requirements of Criteria Consideration G that the building have exceptional importance in architecture or engineering. Given the conventional design of the building, it also appears highly likely that the building would not have a high level of significance, were it to be re-evaluated for architectural merit once it turns fifty years old, using only Criterion C without the application of Criteria Consideration G.

Modernist Historic District Potential: The building is located in a portion of Area B that was developed in the 1960s for recreational and retail sales uses for Air Force personnel and their families. This complex, now known as the Kittyhawk Center, is composed largely of asphalt parking lots and resembles a private-sector shopping center for that the time. Although the area contains a series of buildings constructed between 1960 and 1966, most of the buildings are unremarkable architecturally, and the layout of the complex has no remarkable elements of planning or landscape design. As a conventional shopping and recreational center of the 1960s, the buildings and site elements of Kittyhawk Center do not have strong potential to be eligible as a Modernist historic district.

Sources

Construction Record Drawings, Building 31222. 1965–2011. Electronic copies on file at 88th Air Base Wing Civil Engineering Office, Wright-Patterson Air Force Base, Ohio.

Historic Building File for Building 31222. 2011. On file at 88th Air Base Wing History Office, Building 20014, Wright-Patterson Air Force Base, Ohio.

Skywrighter. 1963. "Base Service Club Destroyed by $66,000 Blaze." August 2, 1963:12. On file at 88th Air Base Wing History Office, Building 20014, Wright-Patterson Air Force Base, Ohio.

———. 1966. "Service Club Opens Sunday." April 30, 1966:6. On file at 88th Air Base Wing History Office, Building 20014, Wright-Patterson Air Force Base, Ohio.

Wright-Patterson Air Force Base. 1966. Real Property Record Card for Buildings 31222. On file at 88th Air Base Wing Civil Engineering Office, Building 30011, Wright-Patterson Air Force Base, Ohio.

Additional Photographs of Building 31222

Figure 70. Building 31222, northeast corner, looking southwest

Figure 71. Building 31222, southwest corner, looking northeast

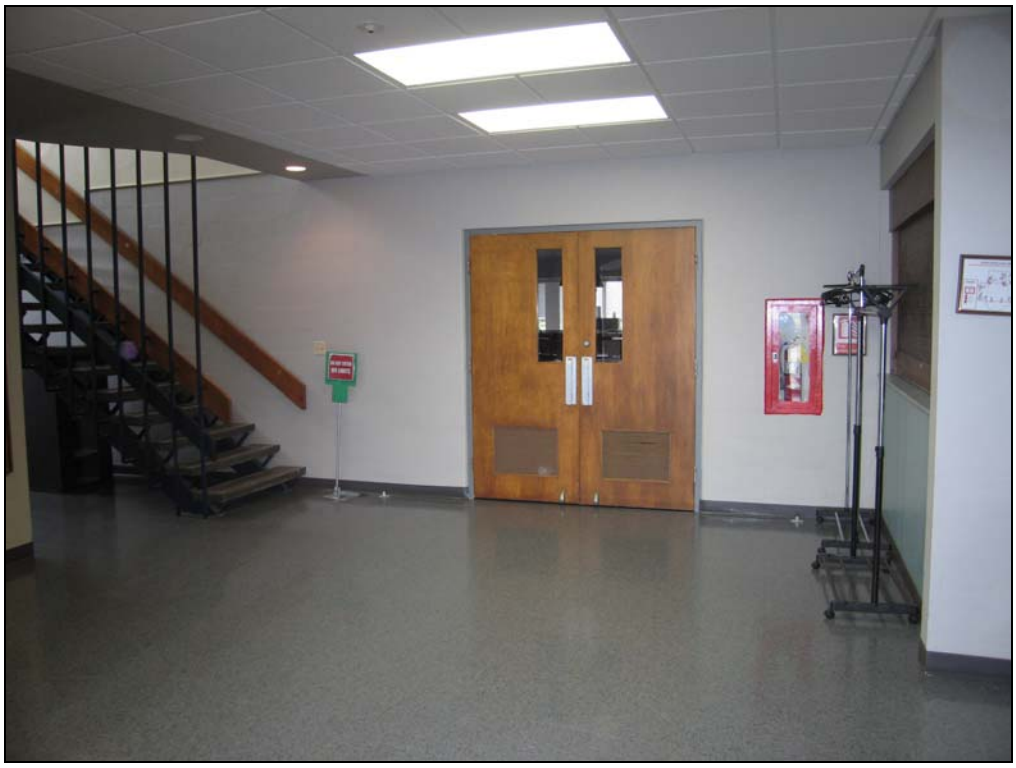

Figure 72. Building 31222, first-floor lobby, looking south

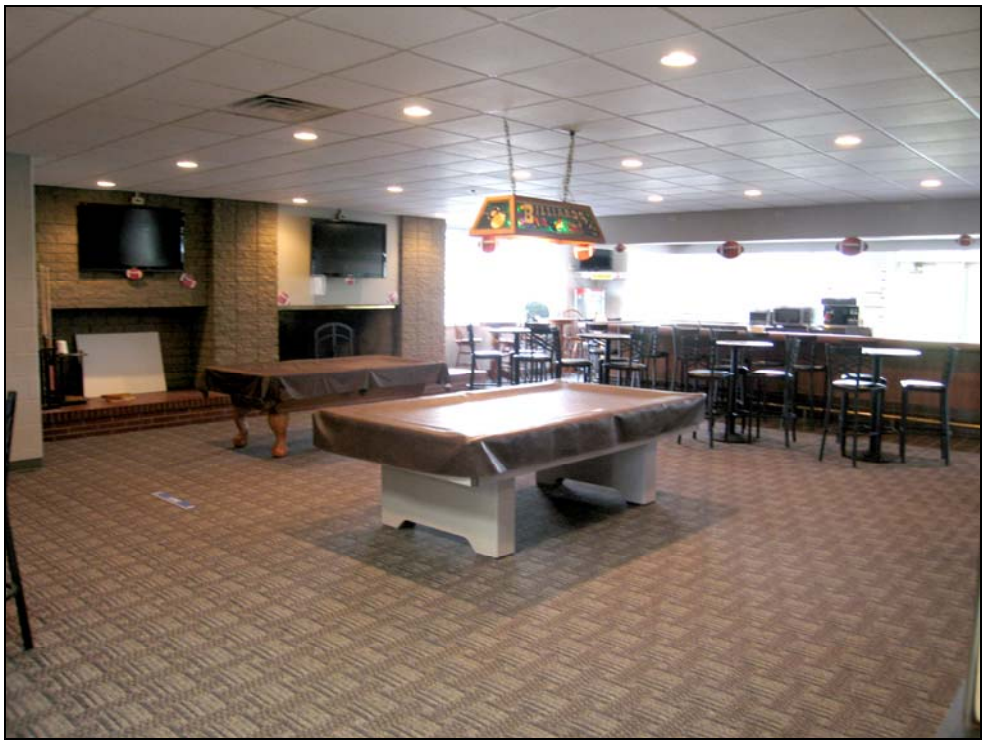

Figure 73. Building 31222, first-floor lounge, looking southeast

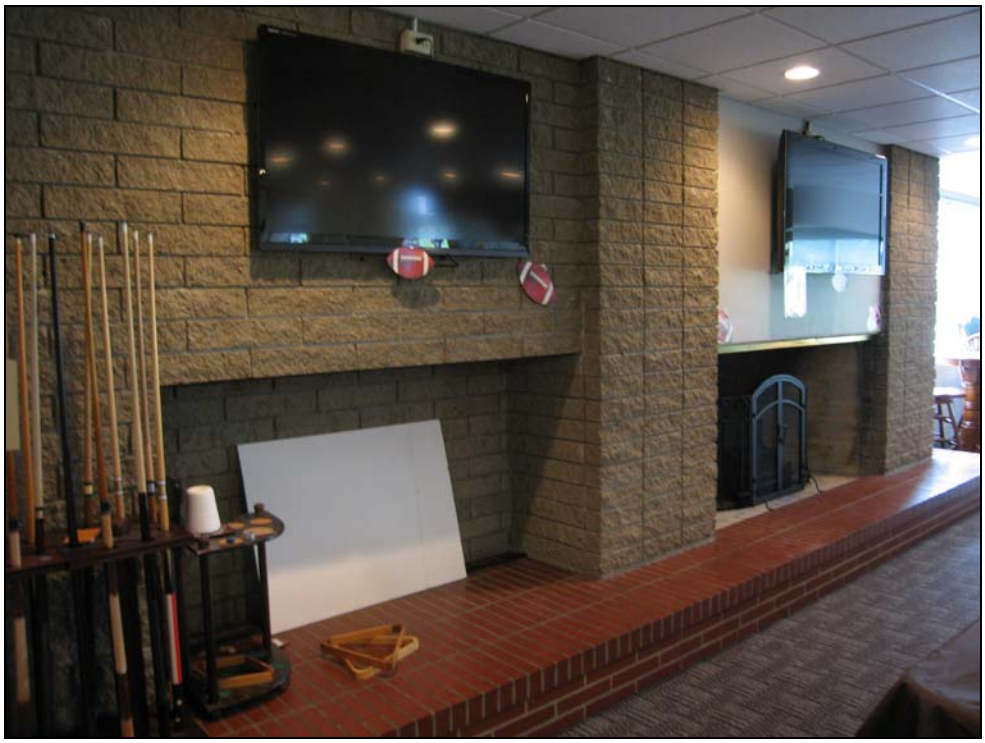

Figure 74. Building 31222, first-floor lounge, detail of fireplace, looking southeast

Figure 75. Building 31222, second-floor corridor, looking west

Figure 76. Building 31222, second-floor room, looking north

Building 31239, Base Theater, 1966

Figure 77. Building 31239, northeast corner, looking southwest

Designer: Daniel, Mann, Johnson & Mendenhall, Architects, Washington, D.C.

Stylistic Influences: For the most part, this building is a plain, functional, brick box. It does have a columned portico on the front of the building that lends the building some degree of Classical dignity, appropriate for a theater and most likely influenced by the New Formalism architectural movement, features of which were often applied to theaters and other performing arts facilities. When viewed from a three-quarter angle, however, the one-story height of the theater lobby causes the two-story portico to look like a false facade. In this case, the feature is awkwardly applied to the facility, and the building cannot be considered a high-style example of New Formalism.

Construction/Engineering: This building has concrete-block walls that are covered on the exterior with brick and stone veneer, and concrete. The building used standard construction technology for its time period.

Description: Building 31239 is a one-story facility located on a grass lot in the Kittyhawk Center portion of Wright-Patterson. Kittyhawk contains retail and recreational facilities for the installation, including stores, a bowling alley, and a recreational building. The area is composed of a grid of streets and a series of large asphalt parking lots, and smaller areas of grass on which the buildings sit. The Building 31239 envelope is, for the most part, a large rectangular red brick box with stone and poured-concrete trim. Since the building is used for

motion pictures, it does not have any windows except for a large glass transom above the front entrance. The buildings doors are modern metal and glass units. The front of the building is punctuated by a six-columned concrete front portico that may have at one time been veneered with stone, although the surface now appears to be a type of synthetic vinyl or concrete finish. The columns are plain square units, and support a plain entablature with a flat roof. The portico is raised up on a concrete foundation, and steps are positioned on the two short ends of the portico. A third narrow set of steps is also positioned in the center of the long end of the portico. The side walls of the building are punctuated on the tops of the walls by a large plain entablature of poured concrete. The interior features a front lobby and concessions room, a 1,000-seat theater space, and a second-story motion-picture projection room that sits on top of the lobby and concession space.

Integrity: Building 31239 has a very high level of exterior integrity. The front doors appear to have been replaced, but the remainder of the stark brick and concrete exterior envelope is largely unaltered. Since the building was not designed with any window openings, window replacement is not an issue for this building. The interior lobby contains some original split-faced concrete-block walls, but other finishes such as floor, ceiling, and painted gypsum board wall surfaces are clearly not original. The concession area of the lobby also has been recently updated. The theater space appears to have its original overall layout, although the floor covering has clearly been replaced, and the current theater seating does not seem to be original. Only fairly minor changes to the building were recorded from 1966–1990 on base property record cards. Overall, the building has a very good level of integrity.

History: In 1963, this site was occupied by the Wood City Service Club, which was a World War II temporary wood-frame building. This portion of Wright-Patterson was known from World War II onward as “Wood City” until the name was changed to “Kittyhawk Center” in the 1970s, in honor of the Wright Brothers. An article in the Wright-Patterson newspaper *Skywrighter* indicates that the Wood City Service Club was destroyed by fire in late January 1963, opening up this site for development.

A January 14, 1966, article in the *Skywrighter* indicated that the theater was planned with 1,000 seats, and that the design by Daniel, Mann, Johnson & Mendenhall was being considered for use as a standard plan for Air Force base theaters. The article stated that the project was managed by the Wright-Patterson Civil Engineering Directorate rather than the U.S. Army Corps of Engineers. Also involved in the project was the Headquarters of the U.S. Army Motion Picture Service. A rendering of the theater was included in a second, brief article in the *Skywrighter* on January 21, 1966. Property record cards show that the building was completed around December 1966 at a cost of $417,740.00. The building has continued to be used as a motion picture theater for the base since that time. Property record cards do not indicate major changes to the exterior or interior of the building from 1966–1990, although the existing lobby decoration and concession area obviously dates from a post-1990 renovation episode.

Building Assessment: The building is a fairly conservative example of Modernism, and is overall a brick box with some concrete trim. The front portico is clearly a feature related to the New Formalism movement, but it has been applied to the front of the building in an unconvincing matter and resembles a false facade when viewed at an angle. The interior is fairly plain and conventional, and the lobby space has lost integrity from remodeling.

Constructed in 1966, Building 31239 will be fifty years old in 2016. Since the building has not reached the fifty-year mark, it would be appropriate to apply Criteria Consideration G along with Criterion C, when assessing the building's architectural merit. The building's sense of New Formalism is not fully integrated into the design but consists of a portico applied to the front of the building. The building is also a fairly conventional theater facility with a plain interior and a box-like brick exterior. This building clearly would not meet the more stringent requirements of Criteria Consideration G that the building have exceptional importance in architecture or engineering. Given the building's status as a fairly plain, conventional theater facility, and as a fairly weak example of New Formalism, it also appears highly likely that the building would not have a high level of significance were it to be re-evaluated for architectural merit once it turns fifty years old, using only Criterion C without Criteria Consideration G.

Modernist Historic District Potential: The building is located in a portion of Area B that was developed in the 1960s for recreational and retail sales uses for Air Force personnel and their families. The complex, known as the Kittyhawk Center, is composed largely of asphalt parking lots and resembles a private-sector shopping center of the time. Although the area contains a series of buildings constructed between 1960 and 1966, most of the buildings are unremarkable architecturally, and the layout of the complex has no distinctive elements of planning or landscape design. As a conventional shopping and recreational center of the 1960s, the buildings and site elements of Kittyhawk Center do not have strong potential to be eligible as a Modernist historic district.

Sources

Construction Record Drawings, Building 31239. 1965–2011. Electronic copies on file at 88th Air Base Wing Civil Engineering Office, Wright-Patterson Air Force Base, Ohio.

Historic Building File for Building 31239. 2011. On file at 88th Air Base Wing History Office, Building 20014, Wright-Patterson Air Force Base, Ohio.

Skywrighter. 1963. "Base Service Club Destroyed by $66,000 Blaze. August 2, 1963:12. On file at 88th Air Base Wing History Office, Building 20014, Wright-Patterson Air Force Base, Ohio.

———. 1966. "New Theater." January 21, 1966:1. On file at 88th Air Base Wing History Office, Building 20014, Wright-Patterson Air Force Base, Ohio.

———. 1966. "1,000-Seat Theater Slated for Wood City Construction." January 14, 1966:1. On file at 88th Air Base Wing History Office, Building 20014, Wright-Patterson Air Force Base, Ohio.

Wright-Patterson Air Force Base. 1966. Real Property Record Card for Buildings 31239. On file at 88th Air Base Wing Civil Engineering Office, Building 30011, Wright-Patterson Air Force Base, Ohio.

Additional Photographs of Building 31222

Figure 78. Building 31239, southeast corner, looking northwest

Figure 79. Building 31239, detail of portico, looking northwest

Figure 80. Building 31239, east wall and portico, looking west

Figure 81. Building 31239, southwest corner, looking northeast

Figure 82. Building 31239, theater space, looking west toward stage

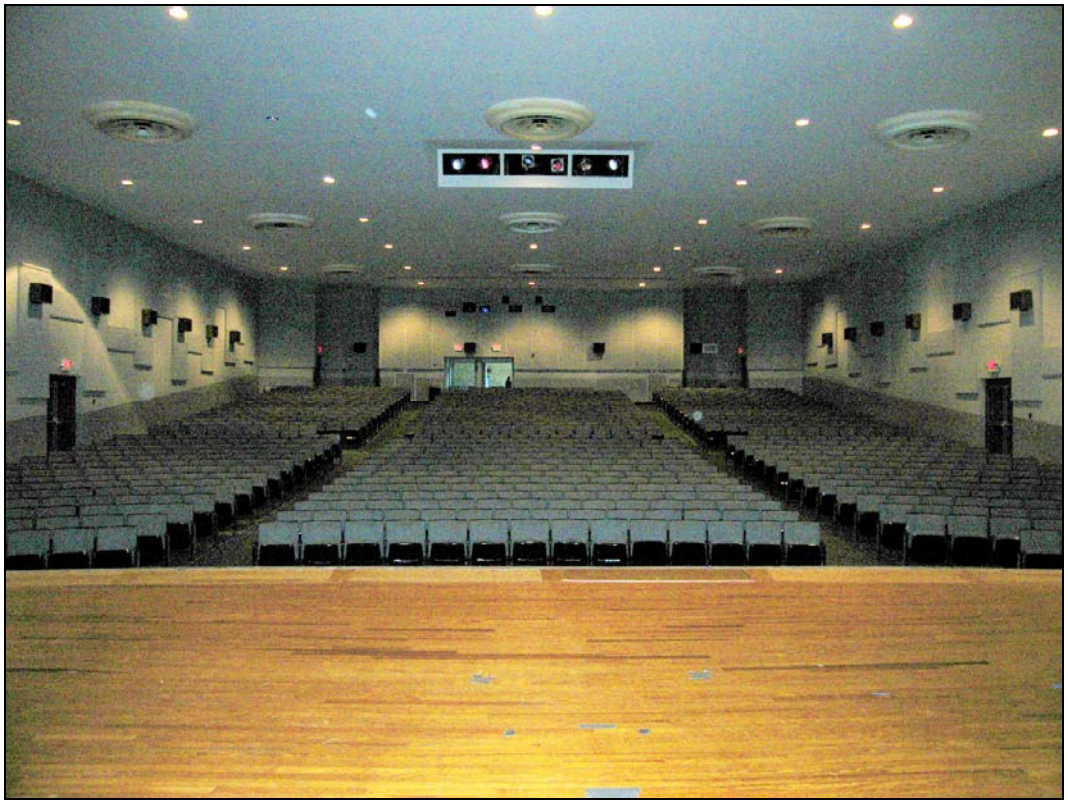

Figure 83. Building 31239, theater space, looking east from stage

Figure 84. Building 31239, second-floor projection room, looking southwest

Figure 85. Building 31239, lobby, looking northwest

APPENDIX B: SOURCES USEFUL IN ASSESSING THE COLD WAR HISTORIC SIGNIFICANCE OF MILITARY BUILDINGS

The following sources are ones that HDC staff have encountered and used during recent efforts to inventory and evaluate military buildings from the 1950–1975 years. These sources are not cited in the main bibliography of this report because for the most part they deal with the Cold War historical significance of buildings and do not touch heavily on architectural Modernism. Some of the sources are also publications that relate to buildings of the 1950–1975 era but focus on building types, such as family housing or hangars, that are not treated extensively in this study.

The entire period covered by this study (1950–1975) overlaps with the historical era of the Cold War. You may well be evaluating a building dating from 1950–1975 both for architectural significance related to Modernism under Criterion C and for Cold War military significance related to Criterion A or possibly Criteria B or D. The sources below provide useful information or guidance in evaluating the Cold War historical significance of a given building or group of buildings dating to the 1950–1975 years.

Coletta, Paolo E. (editor). 1985. *United States Navy and Marine Corps Bases, Domestic*. Greenwood Press, Westport, Connecticut.

Gregory, Carrie, and Martyn Tagg. 2008. *Recording the Cold War: Identifying and Collecting Cold War Resource Data on Military Installations*. Department of Defense Legacy Resource Management Project No. 07-285.

Lavin, Mary K. 1998. *Thematic Study and Guidelines: Identification and Evaluation of U.S. Army Cold War Era Military-Industrial Historic Properties*. Prepared for Horne Engineering & Associates and U.S. Army Environmental Center, Environmental Quality Division, Aberdeen Proving Ground, Maryland.

Lewis, Karen, and Paul Boyer, Joseph S. Murphey, Lori E. Rhodes, and Katherine J. Roxlau. 1995. *A Systematic Study of Air Combat Command Cold War Material Culture*. Volume I: Historic Context and Methodology for Assessment. Mariah Associates Inc., Fort Worth, Texas.

Lonnquest, John C., and David. F Winkler. 1996. *To Defend and Deter: The Legacy of the United States Cold War Missile Program*. U.S. Army Corps of Engineers, Engineering Research Laboratory, Special Report 97/01, sponsored by the Department of Defense Legacy Program, Legacy Project No. 94-1264.

Louis Berger Group Inc. 2009. *Historic Context Statement: The United States Navy in the Cold War*. Prepared by Linda Varelli Wright, Stacey Vairo, Stephen Bedford, Ph.D., Tracy Neumann and Martha Bowers, prepared for the Federal Preservation Officer, Headquarters, Naval Facilities Engineering Command, Washington D.C. Draft copy on file at Naval Facilities Engineering Command Environmental Office, Norfolk, Virginia.

Shiman, Philip. 1995. *Forging the Sword: Defense Production in the Cold War*. U.S. Army Corps of Engineers, Engineering Research Laboratory, Special Report 97/77, sponsored by U.S. Air Force Air Combat Command and the Department of Defense Legacy Program.

United States Air Force. 1993. *Interim Guidance: Treatment of Cold War Historic Properties for U.S. Air Force Installations.* On file at Department of Defense Legacy Program Office, Washington, D.C. 1993.

United States Army Corps of Engineers Construction Engineering Research Laboratory. 1996. *For Want of a Home: A Historic Context for Wherry and Capehart Military Family Housing.* On file at U.S. Army Environmental Center, Aberdeen, Maryland.

Winkler, David. F. 1997. *A Training to Fight: Training and Education During the Cold War*. U.S. Army Corps of Engineers, Engineering Research Laboratory, Special Report 97/99, sponsored by U.S. Air Force Air Combat Command and the Department of Defense Legacy Program.

———. *Cold War Infrastructure for Air Defense: The Fighter and Command Missions.* Prepared for KEA Environmental Inc., under contract with the U.S. Army Corps of Engineers, Fort Worth District, sponsored by Headquarters, Air Combat Command, Langley Air Force Base, Virginia.

APPENDIX C: ACHP PROGRAM COMMENTS ON AMMUNITION STORAGE BUILDINGS (MAGAZINES) AND UNACCOMPANIED PERSONNEL HOUSING (BARRACKS)

This appendix contains copies of two documents issued by the Advisory Council on Historic Preservation (ACHP) that provide alternate procedures for dealing with ammunition storage buildings and unaccompanied personnel housing. The program comments are relevant for surveys involving either of these types of buildings.

- *Program Comment for Cold War Era Unaccompanied Personnel Housing (1946–1974)*, issued 2006
- *Program Comment for World War II and Cold War Era Ammunition Storage Facilities (1939–1974)*, issued 2006

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Preserving America's Heritage

PROGRAM COMMENT FOR
WORLD WAR II AND COLD WAR ERA (1939 – 1974)
AMMUNITION STORAGE FACILITIES

I. Introduction

This Program Comment provides the Department of Defense (DoD) and its Military Departments with an alternative way to comply with their responsibilities under Section 106 of the National Historic Preservation Act with regard to the effect of the following management actions on World War II and Cold War Era ammunition storage facilities that may be eligible for listing on the National Register of Historic Places: ongoing operations, maintenance and repair, rehabilitation, renovation, mothballing, cessation of maintenance, new construction, demolition, deconstruction and salvage, remediation activities, and transfer, sale, lease, and closure of such facilities.

The term Ammunition Storage Facilities means all buildings and structures, listed in or eligible for listing in the National Register of Historic Places, that were designed and built as ammunition storage facilities within the years 1939-1974, regardless of current use, and that are identified by a DoD Category Group (2 digit) code of 42, Ammunition Storage (category code 42XXXX), in the Military Service's Real Property Inventory currently or at the time of construction. Table 1 (attached) provides all such buildings and structures associated with ammunition storage, by Military Department, that are applicable to this program comment.

In order to take into account the effects on Ammunition Storage Facilities, DoD and its Military Departments will conduct documentation in accordance with The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation. As each Military Department will be responsible for conducting its own mitigation actions, the following required documentation is structured by Military Department, followed by DoD-wide requirements.

II. Treatment of Properties

A. Army Mitigation

1. The Army shall expand and revise its existing context study, Army Ammunition and Explosives Storage in the United States, 1775-1945 to include the Cold War Era. This document provides background information and criteria for evaluating the historic significance of such buildings. The updated context study will:

identify the changes in ammunition storage during the Cold War;

focus on the changes required for ammunition storage due to technological advancement in weaponry;

consider the importance of major builders, architects or engineers that may have been associated with design and construction of Ammunition Storage Facilities throughout the Army or at specific Army installations; and

describe the inventory of Ammunition Storage Facilities in detail, providing information on the various types of buildings and architectural styles and the quantity of each.

2. The Army shall undertake in-depth documentation on Ammunition Storage Facilities at nine installations. The existing context study concluded that the Army possessed "only a few basic types and an abundance of examples" of Ammunition Storage Facilities, due to the standardization of ammunition storage facilities beginning in the 1920s. The context study suggests that six geographically dispersed installations contain an array of primary examples of both aboveground and underground magazines with a high degree of integrity:

Hawthorne Army Depot, Nevada – early igloos;

McAlester Army Ammunition Plant, Oklahoma – Corbetta Beehive;

Pine Bluff Arsenal, Arkansas – biological and chemical igloos;

Ravenna Army Ammunition Plant, Ohio – standard World War II and aboveground magazines;

Blue Grass Army Ammunition Plant, Kentucky – standard World War II igloos and aboveground magazines; and

Louisiana Army Ammunition Plant, Louisiana – Stradley special weapons.

The Army shall document these six as well as three additional installations that possess Cold War Era Ammunition Storage Facilities. Documentation at the three additional installations will be determined after completion of the expanded context study described in section II.A.1., above. This study will include a brief history of the installation and the surrounding community, if appropriate, and a detailed history of the storage facilities and documentation of the buildings. The documentation will primarily consist of historic photographs and existing plans. Documentation will be tailored to address the different natures of aboveground and underground storage.

B. Navy Mitigation

1. The Navy will develop a supplemental context study that will be attached as an appendix to the Army's existing context study, Army Ammunition and Explosives Storage in the United States, 1775-1945. The final product will be a separately bound volume of additional information and photographs and tabular appendices that, when presented with the Army's and Air Force's context studies, provide a clear picture of the Department of Defense's Ammunition Storage facilities. This context study appendix will:

cover both World War II and the Cold War Era, from 1939-1974;

explore the changes in ammunition storage resulting from World War II;

examine the changes required for ammunition storage due to technological advancement in weaponry during the Cold War;

consider the importance of major builders, architects or engineers that may have been associated with design and construction of Ammunition Storage Facilities; and

describe the inventory of Ammunition Storage Facilities in detail, providing information on the various types of buildings and architectural styles and the quantity of each.

2. The Navy shall document a representative sample of the basic types of both aboveground and underground ammunition storage facilities. The Navy will choose three geographically dispersed installations with the greatest number and variety of such resources. The Marines will choose one such installation. The sample chosen shall be the best representative examples of the range of Ammunition Storage types constructed during World War II and the Cold War era. This documentation will include collecting existing plans and drawings, writing a historic description in narrative or outline format, and compiling existing historic photographs of the structures. Documentation will be tailored to address the different natures of aboveground and underground storage.

C. Air Force Mitigation

1. The Air Force will develop a supplemental context study that will be attached as an appendix to the Army's existing context study, Army Ammunition and Explosives Storage in the United States, 1775-1945. The final product will be a separately bound volume of additional information and photographs and tabular appendices that, when presented with the Army's and Navy's context studies, provide a clear picture of the Department of Defense's Ammunition Storage facilities. This context study appendix will:

cover the Cold War Era, from 1946-1974;

explore the changes in ammunition storage resulting from the Cold War;

examine the changes required for ammunition storage due to technological advancement in weaponry during the Cold War;

consider the importance of major builders, architects or engineers that may have been associated with design and construction of Ammunition Storage Facilities; and

describe the inventory of Ammunition Storage Facilities in detail, providing information on the various types of buildings and architectural styles and the quantity of each.

2. The Air Force shall document a representative sample of the basic types of both aboveground and underground ammunition storage facilities. The Air Force will choose three geographically dispersed installations with the greatest number and variety of such resources. The sample chosen shall be the best representative examples of the range of Ammunition Storage types constructed during the Cold War era. This documentation would include collecting existing plans and drawings, writing a historic description in narrative or outline format, and compiling existing historic photographs of the structures. Documentation will be tailored to address the different natures of aboveground and underground storage.

3. The Air Force will not be required to consider its World War II Era facilities in these mitigation actions. The Air Force was established in September 1947 and therefore was not associated with structures constructed during this era. Rather the Air Force has inherited its current inventory of 263 World War II Era Ammunition Storage facilities from former Army installations. Given the substantial

mitigation actions that will be undertaken by the Army to document its facilities, further documentation for the small number of similar facilities located at Air Force installations provides no additional historic value. While no documentation will be done on World War II facilities under the Air Force's control, all of the 263 facilities in its inventory are covered under this Program Comment.

D. DoD-Wide Mitigation

1. Copies of the documentation described above will be made available electronically, to the extent possible under security concerns, and hard copies will be placed in a permanent repository, such as the Center for Military History.

2. In addition, as a result of on-going consultations, each Military Department will provide a list of properties covered by the Program Comment, by State, to State Historic Preservation Officers, Tribal Historic Preservation Officers, and other interested parties, as appropriate. Each Military Department will be responsible for determining how to convey its information.

3. All Military Departments will encourage adaptive reuse of the properties as well as the use of historic tax credits by private developers under lease arrangements. Military Departments will also incorporate adaptive reuse and preservation principles into master planning documents and activities.

The above actions satisfy DoD's requirement to take into account the effects of the following management actions on World War II and Cold War Era ammunition storage facilities that may be eligible for listing on the National Register of Historic Places: ongoing operations, maintenance and repair, rehabilitation, renovation, mothballing, cessation of maintenance, new construction, demolition, deconstruction and salvage, remediation activities, and transfer, sale, lease, and closure of such facilities.

III. Applicability

A. 1. This Program Comment applies solely to Ammunition Storage Facilities as defined in Section I, above. The Program Comment does not apply to the following properties that are listed, or eligible for listing, on the National Register of Historic Places: (1) archeological properties, (2) properties of traditional religious and cultural significance to federally recognized Indian tribes or Native Hawaiian organizations, and/or (3) ammunition storage facilities in listed or eligible National Register of Historic Places districts where the ammunition storage facility is a contributing element of the district and the proposed undertaking has the potential to adversely affect such historic district. This third exclusion does not apply to historic districts that are made up solely of ammunition storage facility properties. In those cases the Program Comment would be applicable to such districts.

Since the proposed mitigation for the Ammunition Storage facilities documents site plans, building designs, and the spatial arrangement of ammunition storage facilities, along with the events and actions that lead to the development of standardized ammunition storage facilities in DoD, the important aspects of ammunition storage, whether single buildings or districts made up entirely of ammunition storage, will be addressed regardless of the type of undertaking that may affect this particular property type. The one currently known ammunition storage district, at Hawthorne Army Ammunition Plant, has been identified for further study, as outlined in Section II(A)(2) above.

2. An installation with an existing Section 106 agreement document in place that addresses ammunition storage facilities can choose to:

(i) continue to follow the stipulations in the existing agreement document for the remaining period of the agreement; or

(ii) seek to amend the existing agreement document to incorporate, in whole or in part, the terms of this Program Comment; or

(iii) terminate the existing agreement document, and re-initiate consultation informed by this Program Comment if necessary.

3. All future Section 106 agreement documents developed by the Military Departments related to the undertakings and properties addressed in this Program Comment shall include appropriate provisions detailing whether and how the terms of this Program Comment apply to such undertakings.

IV. Completion Schedule

On or before 60 days following issuance of the Program Comment, DoD, its Military Department and ACHP will establish a schedule for completion of the treatments outlined above.

V. Effect of the Program Comment

By following this Program Comment, DoD and its Military Departments meet their responsibilities for compliance under Section 106 regarding the effect of the following management actions on World War II and Cold War Era ammunition storage facilities that may be eligible for listing on the National Register of Historic Places: ongoing operations, maintenance and repair, rehabilitation, renovation, mothballing, cessation of maintenance, new construction, demolition, deconstruction and salvage, remediation activities, and transfer, sale, lease, and closure of such facilities. Accordingly, DoD installations are no longer required to follow the case-by-case Section 106 review process for such effects. As each of the Military Departments is required under this Program Comment to document their own facilities, failure of any one Military Department to comply with the terms of the Program Comment will not adversely affect the other Departments' abilities to continue managing their properties under the Program Comment.

This Program Comment will remain in effect until such time as the Office of the Secretary of Defense determines that such comments are no longer needed and notifies ACHP in writing, or ACHP withdraws the comments in accordance with 36 CFR § 800.14(e)(6). Following such withdrawal, DoD and its Military Departments would be required to comply with the requirements of 36 CFR §§ 800.3 through 800.7 regarding the effects under this Program Comments' scope.

DoD, its Military Departments and ACHP will review the implementation of the Program Comment seven years after its issuance and determine whether to take action to terminate the Program Comment as detailed in the preceding paragraph.

John L. Nau, III
Chairman

August 18, 2006
Date

Attachment: Table

TABLE 1 - RPCS Hierarchy for Category Group 42

CG & Title	BC	BC Title	FAC	UM	FAC Title	MilDep	CAT CODE	UM AREA	UM OTH	UM ALT	CATCODE LONG NAME
- 42 - Ammunition Storage											
	421	Depot and Arsenal Ammunition Storage									
			4211	SF	Ammunition Storage, Depot and Arsenal						
						Army	42104	SF			EXPLOSIVE TRANSFER BUILDING, DEPOT LEVEL
						Army	42107	SF			STRADLEY, NONATOMIC BLAST RESISTANT, DEPOT LEVEL
						Army	42110	SF			FUSE AND DETONATOR MAGAZINE, DEPOT LEVEL
						Army	42120	SF			HIGH EXPLOSIVE MAGAZINE, DEPOT LEVEL
						Army	42150	SF			SMOKELESS POWDER MAGAZINE, DEPOT LEVEL
						Army	42160	SF			SPECIAL WEAPONS MAGAZINE, DEPOT LEVEL
						Army	42170	SF			GUIDED MISSILE MAGAZINE, DEPOT LEVEL
						Army	42180	SF			IGLOO STORAGE, DEPOT LEVEL
						Army	42181	SF			AMMUNITION STOREHOUSE, DEPOT LEVEL
						Army	42182	SF			SMALL ARMS AMMUNITION MAGAZINE, DEPOT LEVEL
						Army	42183	SF			GENERAL PURPOSE MAGAZINE, DEPOT LEVEL
						Army	42184	SF			AMMUNITION HUT, DEPOT LEVEL
						Army	42186	SF			AMMUNITION STORAGE STRUCTURE, DEPOT LEVEL
						Army	42288	SF			AMMO STORAGE OTHER THAN DEPOT OR UNIT
						Navy	42112	SF		CF	FUSE&DETONATOR MAGAZINE
						Navy	42122	SF		CF	HIGH-EXPLOSIVE MAGAZINE
						Navy	42132	SF		CF	INERT STOREHOUSE
						Navy	42142	SF		CF	SMOKEDRUM STOREHOUSE
						Navy	42148	SF		CF	SMALL-ARMS PYROTECHNIC MAGAZINE
						Navy	42152	SF		CF	SMOKELESS-POWDER-PROJECTILE MAGAZINE
						Navy	42162	SF		CF	SPECIAL-WEAPONS MAGAZINE
						Navy	42172	SF		CF	MISSILE MAGAZINE

		4212	SF	Intercontinental Ballistic Missile Storage Facility				
					Navy	42182	SF	SUBMARINE LAUNCHED BALLISTIC MISSILE STORAGE FACILITY
422	Installation and Ready Issue Ammunition Storage							
		4221	SF	Ammunition Storage, Installation				
					Air Force	422253	SF	STORAGE, MULTI-CUBICLE MAGAZINE
					Air Force	422256	SF	STORAGE, ROCKET CHECKOUT AND ASSEMBLY
					Air Force	422257	SF	STORAGE SEGREGATED MAGAZINE
					Air Force	422258	SF	STORAGE MAGAZINE ABOVE GROUND TYPE A, B, &C
					Air Force	422259	SF	MISSILE STORAGE FACILITY
					Air Force	422264	SF	EA STORAGE IGLOO
					Air Force	422271	SF	STORAGE, MODULE BARRICADED
					Air Force	422273	SF	STORAGE IGLOO STEEL ARCH UNDERPASS
					Army	42210	SF	FUSE AND DETONATOR MAGAZINE, INSTALLATION
					Army	42215	SF	HIGH EXPLOSIVE MAGAZINE, INSTALLATION
					Army	42225	SF	SMOKEDRUM STOREHOUSE, INSTALLATION
					Army	42230	SF	SMALL ARMS AMMUNITION AND PYROTECHNICS MAGAZINE, INSTALI
					Army	42231	SF	AMMUNITION STOREHOUSE, INSTALLATION
					Army	42235	SF	READY MAGAZINE, INSTALLATION
					Army	42240	SF	FIXED AMMUNITION MAGAZINE, INSTALLATION
					Army	42250	SF	SPECIAL WEAPONS MAGAZINE, INSTALLATION
					Army	42260	SF	GUIDED MISSILE MAGAZINE, INSTALLATION
					Army	42280	SF	IGLOO STORAGE, INSTALLATION
					Army	42281	SF	AMMUNITION HUT, INSTALLATION
					Army	42283	SF	GENERAL PURPOSE MAGAZINE, INSTALLATION
					Army	42285	SF	UNIT SMALL ARMS AMMUNITION STORAGE, INSTALLATION
					Army	42286	SF	AMMUNITION STORAGE STRUCTURE, INSTALLATION

				Navy	42135	SF	CF READY MAGAZINE
423	Liquid Propellant Ammunition Storage						
		4231	GA	Liquid Propellant Storage, Ammunition Related			
				Air Force	423111	GA	LIQUID PROPELLANT AMMO STORAGE
				Army	42310	SF GA	LIQUID PROPELLANT STORAGE, AMMUNITION, BUILDING
				Army	42311	GA	LIQUID PROPELLANT STORAGE, AMMUNITION, FACILITY
				Army	42312	SF GA	LIQUID PROPELLANT STORAGE, AMMUNITION, STRUCTURI
				Navy	42310	GA	LIQUID-PROPELLANT STORAGE
424	Weapon-Related Battery Storage						
		4241	SF	Battery Storage, Weapon Related			
				Army	42410	SF	BATTERY COLD STORAGE BUILDING
				Navy	42410	SF	SH WEAPON-RELATED BATTERY STORAGE
425	Open Ammunition Storage						
		4251	SY	Open Ammunition Storage			
				Army	42510	SY	AMMUNITION STORAGE PAD
				Navy	42510	SY	OPEN-AMMUNITION-STORAGE PAD
				Navy	42520	SY	CONTAINER-HOLDING YARD -EMPTY
				Navy	42530	SY	BARRICADED MODULE (OPEN)

Preserving America's Heritage

PROGRAM COMMENT FOR
COLD WAR ERA UNACCOMPANIED PERSONNEL HOUSING (1946 – 1974)

I. Introduction

This Program Comment provides DoD, and its Military Departments with an alternative way to comply with their responsibilities under Section 106 of the National Historic Preservation Act with regard to the effect of the following management actions on Cold War Era Unaccompanied Personnel Housing (UPH) that may be listed or eligible for listing on the National Register of Historic Places: ongoing operations, maintenance and repair, rehabilitation, renovation, mothballing, cessation of maintenance, new construction, demolition, deconstruction and salvage, remediation activities, and transfer, sale, lease, and closure of such facilities.

The term UPH means all buildings and structures, listed or eligible for listing on the National Register of Historic Places, that were designed and built as UPH in the years 1946-1974, regardless of use. This will be all such buildings and structures with the DoD Category Group (2 digit) Code of 72, Unaccompanied Personnel Housing, in the Military Service's Real Property Inventory currently or at the time of construction. Buildings in Category Group Code 72 include UPH and associated buildings and structures such as dining halls and laundry facilities constructed to support military housing needs. Table 1 (attached) provides all such buildings and structures, by Military Department, that are applicable to this program comment.

In order to take into account the effects on such UPH, DoD and its Military Departments will conduct documentation in accordance with The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation. As each Military Department will be responsible for conducting its own mitigation actions, the following required documentation is structured by Military Department, followed by DoD-wide requirements.

II. Treatment of Properties

A. Army Mitigation

1. In 2003, the Army completed a study entitled Unaccompanied Personnel Housing (UPH) During the Cold War (1946-1989). This Historic Context study was undertaken to support the analysis of real property related to Army UPH, and to support the identification and evaluation of historic properties. In addition to providing historic information regarding the UPH program, the study also documents the property types defined in their historic context. In-depth archival research of primary and secondary sources was undertaken on the organizational history, doctrines, and policies that influenced the design and development of Army UPH during the Cold War era. Data were collected to identify significant events and policies that influenced site plans, building design, and spatial arrangement of Army UPH

facilities. Archival research was also directed to compile data on the evolution and modification of these property types over time. In addition, site visits to six Army installations containing UPH facilities were completed. The installations were examined to identify and document UPH-related property types based on extant real property in the Army inventory. These case studies included a summary installation history, interview data from the cultural resource management, a review of extant real property, and a detailed architectural analysis of the design, materials, construction and modification of over 700 examples of Army UPH. The resulting report provides a comprehensive and detailed record of Army UPH, including a collection of site plans, as-built building plans, and photographs (Chapter 4). Since these standard designs have already been well documented, no additional documentation of the Army's UPH is needed as part of the overall DoD mitigation. However, the Army should verify and document, as necessary, any building types and structures included on Table 1 that may not have been included in Unaccompanied Personnel Housing (UPH) During the Cold War (1946-1989).

2. The Army, in order to take into account effects on potentially historic UPH, will amend Unaccompanied Personnel Housing (UPH) During the Cold War (1946-1989) in order to make it available to a wider audience. Due to security concerns, the distribution of the context study is limited to US Government Agencies Only. The Army will remove the elements of the document that are security risks and then make the context available to DoD for consolidation with information gathered on Navy and Air Force UPH as required by Section II(D)(2), below..

B. Navy Mitigation

1. The Navy will produce a supplemental context study appendix that will be attached as an appendix to the Army's Unaccompanied Personnel Housing (UPH) During the Cold War (1946-1989). The final product will be a separately bound volume of additional information and photographs and tabular appendices that, when taken with the Army's and Air Force's context studies, provide a clear picture of the DoD's UPH. The context study appendix will:

> explore the post-World War II changing demographics of Navy personnel and its impact on housing needs;
>
> amend, as necessary, and adopt the Army's criteria for evaluating the historic significance of UPH;
>
> consider the importance of major builders, developers and architects that may have been associated with design and construction of UPH; and
>
> describe the inventory of UPH in detail, providing information on the various types of buildings and architectural styles and the quantity of each.

2. The Navy shall document a representative sample of the basic types of UPH. The Navy will choose three geographically dispersed installations with the greatest number and variety of such resources. The Marine Corps will choose one such example. The sample chosen shall be the best representative examples of the range of UPH types constructed during the Cold War era. This documentation would include collecting existing plans and drawings, writing a historic description in narrative or outline format, and compiling historic photographs of the buildings (similar in scope to the Army's documentation).

C. Air Force Mitigation

1. The Air Force will produce a supplemental context study appendix that will be attached to the Army's Unaccompanied Personnel Housing (UPH) During the Cold War (1946-1989). The final product will be a

separately bound volume of additional information and photographs and tabular appendices that, when taken with the Army's and Navy's context studies, provide a clear picture of the Department of Defense's UPH. The context study appendix will:

explore the post-World War II changing demographics of Air Force personnel and its impact on housing needs;

amend, as necessary, and adopt the Army's criteria for evaluating the historic significance of UPH;

consider the importance of major builders, developers and architects that may have been associated with design and construction of UPH; and

describe the inventory of UPH in detail, providing information on the various types of buildings and architectural styles and the quantity of each.

The Air Force shall include documentation of representative sampling of the basic types of UPH. The Air Force will choose three geographically dispersed installations with the greatest number and variety of such resources. The sample chosen shall be the best representative examples of the range of UPH types constructed during the Cold War era. This documentation would include collecting existing plans and drawings, writing a historic description in narrative or outline format, and compiling historic photographs of the buildings, and would be similar in scope to the Army's documentation.

D. DoD-Wide Mitigation

1. Additionally, DoD recently completed a draft context study entitled The Built Environment of Cold War Era Servicewomen through the Legacy Resource Management Program. This context study examines how the needs of women service members shaped construction plans and practices of several types of facilities, including UPH. The Legacy Program recently approved funds for the completion of this document. The legacy program will make the context study available to the Military Departments and the public to enhance the consideration and documentation of the UPH story.

2. DoD and its Military Departments will make copies of all documentation available electronically, to the extent possible under security concerns, and hard copies will be placed in a permanent repository, such as the Center for Military History. DoD will consolidate information from the Navy and Air Force documentation with the context provided by the Army, as required by Section II(A)(2) above, and make it available for public distribution.

3. As a result of on-going consultations with stakeholders, each Military Department will provide a list of its UPH properties covered by the Program Comment, by State, to stakeholders. Each Military Department will be responsible for determining how to convey its information.

4. All Military Departments will encourage adaptive reuse of UPH properties as well as the use of historic tax credits by private developers under lease arrangements. Military Departments will also incorporate adaptive reuse and preservation principles into master planning documents and activities.

These actions satisfy DoD's requirement to take into account the effects of the following management actions on DoD UPH that may be listed or eligible for listing on the National Register of Historic Places: ongoing operations, maintenance and repair, rehabilitation, renovation, mothballing, ceasing maintenance activities, new construction, demolition, deconstruction and salvage, remedial activities, and transfer, sale, lease, and closure.

III. Applicability

A. This Program Comment applies solely to Cold War Era DoD UPH as defined in Section I, above. The Program Comment does not apply to the following properties that are listed, or eligible for listing, on the National Register of Historic Places: (1) archeological properties, (2) properties of traditional religious and cultural significance to federally recognized Indian tribes or Native Hawaiian organizations, and/or (3) UPH in listed or eligible National Register of Historic Places districts where the UPH is a contributing element of the district and the proposed undertaking has the potential to adversely affect such historic district. This exclusion does not apply to historic districts that are made up solely of UPH properties. In those cases the Program Comment would be applicable to such districts.

Since the proposed mitigation for UPH documents site plans, building designs, and the spatial arrangement of UPH, along with the events and actions that lead to the development of UPH, the important aspects of UPH, whether single buildings or districts made up entirely of UPH, will be addressed regardless of the type of undertaking that may affect this particular property type.

B. An installation with an existing Section 106 agreement document in place that addresses UPH can choose to:

(1) continue to follow the stipulations in the existing agreement document for the remaining period of the agreement; or

(2) seek to amend the existing agreement document to incorporate, in whole or in part, the terms of this Program Comment; or

(3) terminate the existing agreement document, and re-initiate consultation informed by this Program Comment if necessary.

C. All future Section 106 agreement documents developed by the Military Departments related to the undertakings and properties addressed in this Program Comment shall include appropriate provisions detailing whether and how the terms of this Program Comment apply to such undertakings.

IV. Completion Schedule

On or before 60 days following approval of the Program Comment, DoD, its Military Departments and ACHP will establish a schedule for completion of the treatments outlined above.

V. Effect of the Program Comment

By following this Program Comment, DoD and its Military Departments meet their responsibilities for compliance under Section 106 regarding the effect of the following management actions on Cold War era DoD UPH that may be listed or eligible for listing on the National Register of Historic Places: ongoing operations, maintenance and repair, rehabilitation, renovation, mothballing, ceasing maintenance activities, new construction, demolition, deconstruction and salvage, remedial activities, and transfer, sale, lease, and closure. Accordingly, DoD installations are no longer required to follow the case-by-case Section 106 review process for such effects.

As each of the Military Departments is required under this Program Comment to document their own facilities, failure of any one Military Department to comply with the terms of the Program Comment will not adversely affect the other Departments' abilities to continue managing their properties under the Program Comment.

VI. Duration and Review of the Program Comment

This Program Comment will remain in effect until such time as DoD or its individual Military Departments determine that such comments are no longer needed and notifies ACHP in writing, or ACHP withdraws the comments in accordance with 36 CFR § 800.14(e)(6). Following such withdrawal, DoD or its individual Military Departments would be required to comply with the requirements of 36 CFR §§ 800.3 through 800.7 regarding the effects under this Program Comments' scope.

DoD, its Military Departments and ACHP will review the implementation of the Program Comment seven years after its issuance and determine whether to take action to terminate the Program Comment as detailed in the preceding paragraph.

John L. Nau, III
Chairman

August 18, 2006
Date

Attachment: Table 1

TABLE 1 - RPCS Heirarchy for Category Group 72

CG & Title	BC	BC Title	FAC	UM	FAC Title	MilDep	CAT CODE	UM AREA	UM OTH	UM ALT	CATCODE LONG NAME
- 72 - Unaccompanied Personnel Housing											
	721	Enlisted Unaccompanied Personnel Housing									
			7210	SF	Enlisted Unaccompanied Personnel Housing						
						Air Force	721312	SF	PN		DORMITORY AIRMAN PERMANENT PARTY/PCS-STUDENT
						Air Force	721313	SF	PN		TECHNICAL TRAINING STUDENT HOUSING
						Air Force	721314	SF	PN		DORMITORY, UNACCOMPANIED NCO
						Army	72111	SF	SP		ENLISTED UNACCOMPANIED PERSONNEL HOUSING
						Army	72170	SF	SP		UNACCOMPANIED PERSONNEL HOUSING, SENIOR NCO
						Navy	72111	SF	PN		BACHELOR ENLISTED QUARTERS E1/E4
						Navy	72112	SF	PN		BACHELOR ENLISTED QUARTERS E5/E6 (MARINE CORPS E-5 ONLY)
						Navy	72113	SF	PN		BACHELOR ENLISTED QUARTERS E7 THRU E9 (MARINE CORPS E6/E9)
						Navy	72124	SF	PN		BACHELOR ENL QTRS-MARINES E1/E4
						Navy	72125	SF	PN		BACHELOR ENL QTRS-MARINES E5
						Navy	72126	SF	PN		BACHELOR ENL QTRS-MARINES E6/E9
						Navy	72130	SF	PN		CIVILIAN BARRACKS -GS 01 THRU 06
						Navy	72131	SF	PN		CIVILIAN BARRACKS-BASE OPERATING SUPPORT CONTRACTOR
						Navy	72146	SF	PN		BERTHING--NAVAL HOME

	7212	SF	Enlisted Unaccompanied Personnel Housing, Transient				
				Air Force	721315	SF	PN	DORMITORY VISITING AIRMAN QUARTERS
				Navy	72121	SF	PN	BACHELOR ENL QTRS-TRANSIENT E1/E4
				Navy	72122	SF	PN	BACHELOR ENL QTRS-TRANSIENT E5/E6
				Navy	72123	SF	PN	BACHELOR ENL QTRS-TRANSIENT E7/E9
				Navy	72153	SF	PN	TRANSENT PERSONNEL UNIT BARRACKS E7-E9
	7213	SF	Student Barracks				
				Army	72121	SF	SP	TRANSIENT UPH, ADVANCED INDIVIDUAL TRAINEES (AIT)
				Army	72122	SF	SP	TRANSIENT UPH, ADVANCED SKILLS TRAINEES (AST)
				Navy	72114	SF	PN	CLASS A STUDENT BARRACKS
				Navy	72117	SF	PN	OFFICER CANDIDATE SCHOOL (OCS)
				Navy	72118	SF	PN	NAVAL ACADEMY PREPARATORY SCHOOL (NAPS)
				Navy	72119	SF	PN	BROADENED OPPORTUNITY FOR OFFICER SELECTION TRNG (BOOST)
				Navy	72424	SF	PN	OFFICER INDOCTRINATION SCHOOL (OIS)
	7214	SF	Annual Training/Mobilization Barracks				
				Army	72114	SF	SP	ENLISTED BARRACKS, TRANSIENT TRAINING
				Army	72115	SF	SP	ENLISTED BARRACKS, MOBILIZATION
	7218	SF	Recruit/Trainee Barracks				
				Air Force	721311	SF	PN	RECRUITS DORMITORY
				Army	72181	SF	SP	TRAINEE BARRACKS
				Navy	72115	SF	PN	RECRUIT-TYPE BARRACKS
722	Unaccompanied Personnel Housing Mess Facilities							

		7220	SF	Dining Facility			
					Air Force	721215	SF	PN	DINING HALL IN AIRMAN DORMITORY
					Air Force	722345	SF		FAST FOOD SERVICE
					Air Force	722351	SF	PN	AIRMAN DINING HALL - DETACHED
					Air Force	722356	SF	PN	DINING HALL, OFFICER, DETACHED
					Army	72210	SF	PN	DINING FACILITY
					Army	72212	SF	PN	DINING FACILITY - TRANSIENT TRAINING
					Navy	72145	SF	PN	DINING-FACILITY -BUILT-IN/ATTACHED
					Navy	72210	SF	PN	ENLISTED DINING-FACILITY
					Navy	72231	SF	PN	DINING-FACILITY -DETACHED-CIV PERS
					Navy	72241	SF	PN	DINING-FACILITY -DETACHED-COM PERS
					Navy	72430	SF	PN	COMMISSIONED-OFFICERS MESS -CLOSED(BLT-IN/ATCHD)
723	Detached Unaccompanied Personnel Housing Facilitie								
		7231	SF	Miscellaneous UPH Support Building					
					Air Force	723155	SF		DAYROOM LOUNGE
					Army	72310	SF		UPH LAUNDRY BUILDING, DETACHED
					Army	72360	SF		MISCELLANEOUS FACILITIES, DETACHED
					Navy	72330	SF		LAUNDRY DETACHED
					Navy	72360	SF		TROOP-HOUSING -OTHER DETACHED BUILDINGS
					Navy	72377	SF		TROOP HOUSING STORAGE (READY ISSUE/SHOP STORES/MISC.)
		7232	SF	Unaccompanied Personnel Housing Garage/Carport					
					Air Force	723242	SF	VE	GARAGE AUTOMOBILE
					Army	72350	SF	VE	GARAGE, UPH, DETACHED
					Army	72351	SF	VE	CARPORT, UPH

				Navy	72340	SF	VE	GARAGES DETACHED -BACHELOR HOUSING
	7233	SF	Dining Support Facility					
				Air Force	723385	SF		KITCHEN, CENTRAL PREPARATION
				Air Force	723388	SF		FLIGHT KITCHEN
				Navy	72250	SF	NS SH	COLD-STORAGE -DETACHED-FROM-GALLEY
	7234	SF	Latrine/Shower Facility					
				Air Force	714124	SF		ATTENDANTS SANITARY FACILITIES
				Air Force	723392	SF		SANITARY LATRINE
				Navy	72320	SF	PN	LATRINE DETACHED
	7235	EA	Miscellaneous UPH Support Facility					
				Air Force	750663		EA	PRIVATELY OWNED VEHICLE WASHRACK
				Navy	72350		EA	WASH-RACK DETACHED
				Navy	72361		EA	TROOP-HOUSING -OTHER DETACHED FACILITIES
724	Officer Unaccompanied Personnel Housing Facilities							
	7240	SF	Officer Unaccompanied Personnel Housing					
				Air Force	724415	SF	PN	OFFICER'S QUARTERS
				Air Force	724433	SF	PN	CADET QUARTERS
				Army	72410	SF	PN	UNACCOMPANIED OFFICERS QUARTERS, MILITARY
				Navy	72411	SF	PN	BACHELOR OFFICERS' QUARTERS PERMANENT PARTY W1/W2 & 01/02
				Navy	72412	SF	PN	BACHELOR OFFICERS QUARTERS PERMANENT PARTY W3-W5 & 03UP
				Navy	72422	SF	PN	CIVILIAN QUARTERS -GS 07 AND ABOVE
				Navy	72423	SF	PN	CIVILIAN QUARTERS-BASE OPERATING SUPPORT CONTRACTOR

		7241	SF	Officer UPH, Transient			
					Air Force	724417	SF	PN	VISITING OFFICER'S QUARTERS
					Army	72412	SF	PN	TRANSIENT TRAINING OFFICERS QUARTERS
					Navy	72413	SF	PN	BACHELOR OFFICERS QUARTERS TRANSIENT W1/W2 AND 01/02
					Navy	72414	SF	PN	BACHELOR OFFICERS QUARTERS TRANSIENT W3-W5 AND 03&UP
725	Emergency Unaccompanied Personnel Housing Faciliti								
		7250	SF	Emergency Unaccompanied Personnel Housing					
					Air Force	725513	SF	PN	CIVILIAN CAMP
					Air Force	725517	SF	PN	CAMP TROOP
					Army	72510	SF	PN	HUTMENT
					Navy	72510	SF	PN	TROOP-HOUSING -EMERGENCY BUILDING
		7251	SF	EUPH Tent Pad					
					Army				TENT PAD
					Navy				TROOP-HOUSING -EMERGENCY FACILITY